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Standardization

and Commercial Standards Monthly

February

In Two Parts—Part I

New War Requirements for Electrical Indicating Instruments

(See Article on Page 41)

1943

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Industrial
Standardization
And Commercial Standards Monthly

Published Monthly by
American Standards Association
29 West 39th Street, New York, N. Y.
with the cooperation of the National Bureau of Standards
RUTH E. MASON, Editor

Our Front Cover: 2½-inch panel-type electrical indicating instruments. *Courtesy Westinghouse.*

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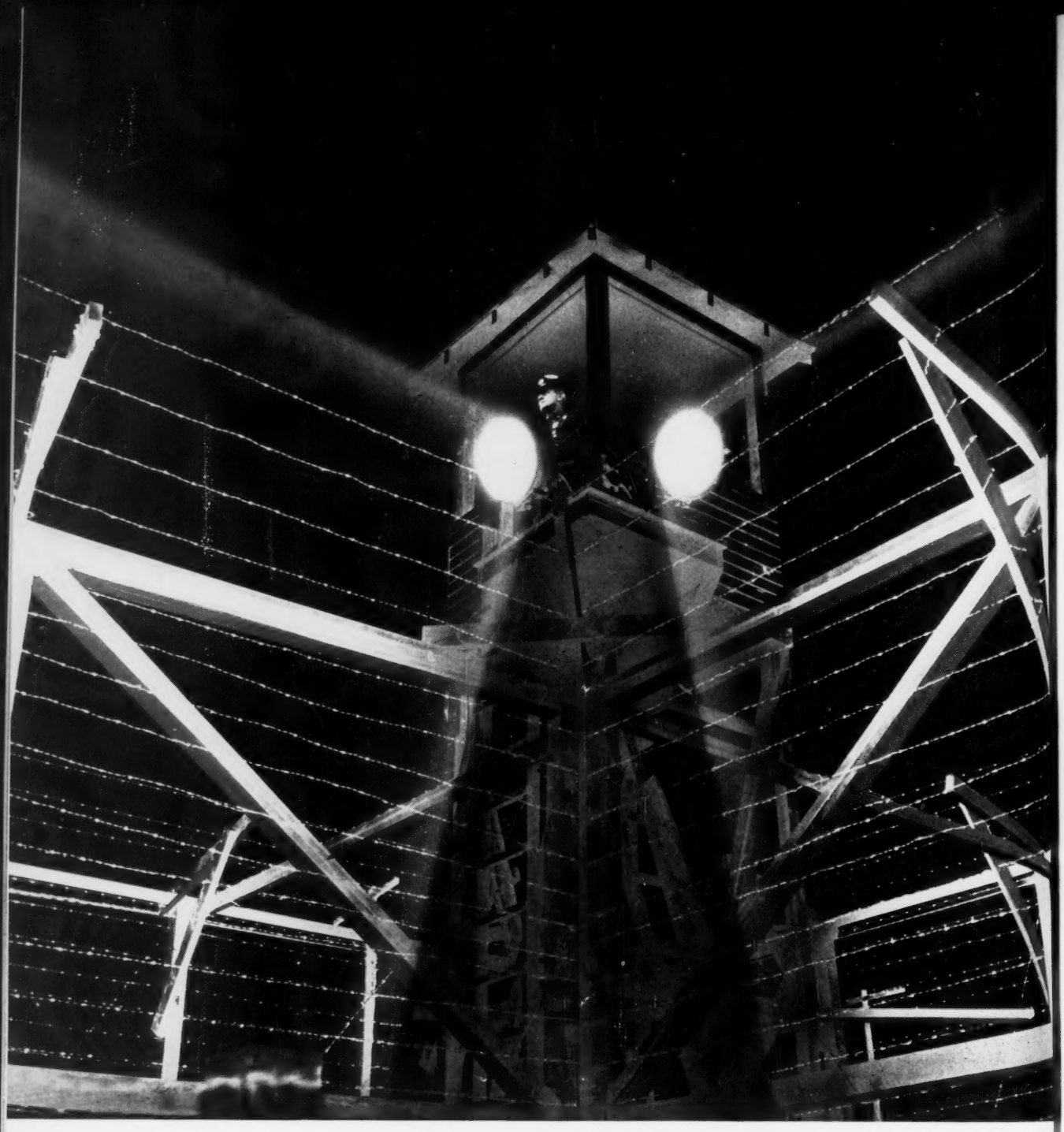
Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

February, 1943 Vol. 14, No. 2

Entered as Second Class Matter February 14, 1941, at the Post Office at New York, N. Y., under the Act of March 3, 1879.



Courtesy Westinghouse

Protective lighting of industrial properties prevents saboteurs from reaching vital war-production objectives under cover of darkness.

Correct Lighting Protects Against Sabotage

New American War Standard Outlines Requirements For Protective Lighting of Industrial Properties

by Cyril Ainsworth[1]
Assistant Secretary, American Standards Association

THOSE who have passed industrial plants engaged in war work and have noticed the extensive illumination which surrounds the buildings and properties have probably realized that this lighting is intended to decrease the possibility of theft or sabotage. Few may have realized, however, how extensive are the technical considerations which have gone into the installation of such a lighting system. Several months of work by a group of experts, as well as comment and criticism from a large group of key individuals, went into preparation of the recently completed American War Standard for Protective Lighting of Industrial Properties. This standard gives in considerable detail the technical requirements for a protective lighting system which can be considered satisfactory for protection against thieves and saboteurs.

War Increases Need

Many industrial plants had already installed protective lighting systems long before the war. After the war started, however, the administrative authorities concerned asked many other plants also to install such systems in order that production might not be interrupted through sabotage. This greatly increased demand for effective protective lighting immediately pointed to the need for specifications to outline satisfactory requirements for a protective lighting system. To meet this need, the Insurance Committee for the Protection of American Industrial Plants asked the American Standards Association to initiate a project on outdoor protective lighting of industrial properties. Soon after this request, the War Department made a similar request, but later, before the project was completed, withdrew as a joint sponsor for the undertaking.

The American Standards Association agreed to undertake the development of these specifications under its War Standards Procedure, and organized a technical committee to assemble technical data, prepare a draft specification, and review the comments and criticisms received from persons interested in the subject.

Principles of Protective Lighting

This committee first proceeded to determine just what protective lighting was designed to accomplish, and what principles should be followed in the writing of the specifications. Its findings can best be illustrated by quoting directly from the standard:

"Adequate light and normal vision are the essential tools for seeing quickly, accurately, and easily. Many benefits of more light and better lighting have been revealed since the First World War. This increasing knowledge has been revolutionizing lighting recommendations and practices. These benefits which are appealing in peacetime become essential in wartime with no end in sight for the all-out effort to produce maximally with the least waste in human and material resources.

" 'Protective' lighting is a wartime auxiliary to 'productive' lighting. It must combat darkness which crowds in from everywhere at night. Here it promotes safety and security from sabotage and in this protective role light should reveal the saboteur while darkness should conceal the guard. Here glare, so undesirable in productive lighting, can be utilized in protective lighting to blind the trespasser and to obscure the guard.

Seeing in the Dark

"In the darkness outdoors the problems of seeing are doubly important. The guard's eyes should be protected from brightness and glare so that they remain dark-adapted. In this state they can detect very low brightnesses and, therefore, movements. Good protective seeing is achieved

[1] Acting chairman of the American War Committee on Protective Lighting of Industrial Properties.

by adequate light upon no-man's-land, glaring light in the eyes of the trespasser, and no light upon the guard; and in aiming to provide protective seeing, high brightness-contrast between trespasser and background should be a first consideration. This may be accomplished by adequate light and the proper use of paint.

"Protective lighting is intended to facilitate the night-time policing of vulnerable properties. It is therefore essential that it be designed to provide adequately for policing requirements."

How to Measure Efficiency

Having established the objective of protective lighting, the committee then enumerated the following basic principles which may be applied to any protective lighting system as a measure of its efficiency:

(*a*) It should provide adequate illumination to discourage and detect attempts to enter a property, and to reveal unauthorized persons within the property.

(*b*) It should avoid glare that handicaps the guards or is a source of annoyance to street and highway traffic, marine or railroad operations, occupants of adjacent buildings, or workers on neighboring projects.

Glare directed at the intruder, if not in violation of the above, is effective in handicapping the seeing ability of the would-be saboteur and in preventing the discovery of the guard.

(*c*) It should illuminate shadowed areas caused by adjacent structures.

(*d*) It should coordinate the lighting with the guard stations or patrol routes to provide maximum concealment for the guard. Patrol roads and paths should be kept in relative darkness.

(*e*) It should avoid leaving areas dependent upon a single lamp or circumstances where the failure of one lamp, as for example in the boundary circuit, would create a dark passageway into the property.

(*f*) It should provide special treatment for such situations as railroad sidings, alleys, roofs of abutting buildings, wooded or water approaches, entrances and exits.

(*g*) It should be dependable in operation and provision should be made for convenient control and maintenance. Suitable control is essential for purposes of blackout.

(*h*) Means of concealment such as bushes, tall grass, and weeds should wherever possible be removed from approaches to the property.

(*i*) Poles, lighting equipment, and electrical auxiliaries should be located inside the property fence or where they are not readily accessible to malicious damage.

(*j*) It is desirable to supplement the fixed lighting with searchlights controllable by the guards and permitting explorations outside the property or augmenting the fixed lighting within the property in the event of an emergency.

Realizing that industrial plants differ widely in their physical character and that specific rules could not be stated for all possible conditions, the committee in building the standard decided to set up general rules supplemented by appendix material that would be sufficiently comprehensive for adaptation to specific situations.

Minimum Levels Recommended

The committee has been careful to point out that in applying the provisions of the standard, the illumination levels recommended are the minimum levels believed to be necessary for policing properties, but that the levels are not necessarily adequate for efficiency from the standpoint of plant operations. For example, the lighting recommended as a protective measure for a stock pile is not necessarily sufficient illumination to permit of maximum efficiency or safety for workmen handling the material.

The question that is most often asked by the persons interested in protective lighting is: "Does

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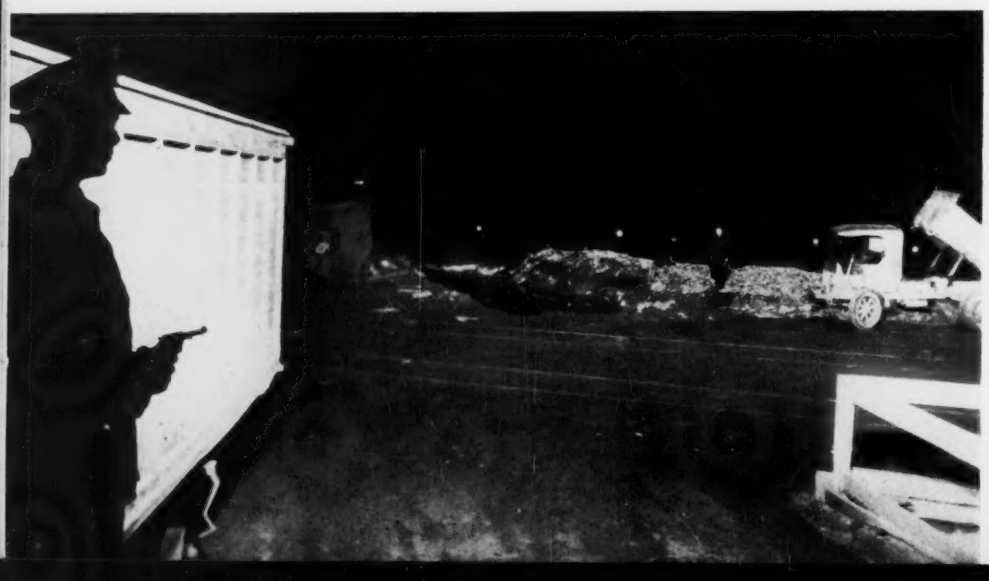


A watchman is screened from the saboteur by the glare of protective floodlights, but has a clear view of any intruder.

the standard cover protective lighting for industrial properties located in dimout areas?" This question was discussed at considerable length by the members of the committee who decided that inasmuch as the values specified in the standard were the minimum values that should be obtained and still provide protection from theft and sabotage, it was impossible for the committee to prepare any specifications for protective lighting of industrial properties located in dimout areas. It recommended that persons interested in protective lighting for properties in dimout areas should confer with those responsible for the administration of dimout and blackout regulations in the areas where the plants are located. In other words, dimout lighting and protective lighting are actually in conflict with one another, and industrial plants in dimout areas must be guided by the advice received from the properly constituted authorities.

Types of Boundaries

The specifications for protective lighting systems are divided into two main parts: the first pertains to boundary and approaches; and the second to areas and structures within property lines. Boundaries are in turn discussed according to whether or not they are fenced boundaries, unfenced boundaries, or whether the boundaries are formed by building faces. Boundaries formed by water fronts, and the entrances through boundaries are also covered.

The appendix to the standard is very extensive and discusses in some detail the types of lighting equipment which are most suitable for protective lighting purposes. It describes the conditions and locations where particular types of lighting equipment can be used to the best advantage, types of circuits, and control methods. Typical methods of obtaining specified illumination values are outlined, and sketches are provided which clearly illustrate the typical methods discussed in the text.

It has already been mentioned that many industrial plants had installed protective lighting at the time of the outbreak of the war. The new specifications will be of value to such organizations in carrying out studies to determine the efficiency of their lighting systems. It is quite likely, however, that plants which have not already installed protective lighting may experience some difficulties in securing the necessary materials for use in constructing a new lighting system. The relation of the work of the plant with the war effort will undoubtedly have a definite bearing on this problem.

The interested governmental agencies, insurance groups, and industrial plants are indebteded to the technical committee for the valuable advice and assistance which they have given throughout the development of these specifications, and the American Standards Association desires to express its grateful acknowledgment of this service.

A great increase in the use of American Safety Standards is shown by the rise in sales during the year. In 1942 the sale of American Safety Standards was *287 per cent* of the total sale for 1941.

This is due in part to the cooperation of the National Committee for the Conservation of Manpower in War Industries, the insurance companies, and various governmental agencies including the War Department, that have been pushing the use of these standards.

A complete list of American Safety Standards can be obtained from the American Standards Association without charge. American War Standards are also listed.

The American War Standard for Protective Lighting of Industrial Properties (A85-1942) is now available from the ASA at 50 cents.

Courtesy Westinghouse

A saboteur, attempting to enter a correctly lighted industrial property, is blinded by the direct beams of the protective lighting system.

Brady, South American Representative, Visits United States

CYRUS T. BRADY, JR., field representative of the American Standards Association in its recently launched Latin-American program, has just completed a brief stay at the New York offices of the American Standards Association before returning to Latin America. On his way to the United States he traveled through Argentina, Uruguay, Paraguay, Brazil, and Bolivia. He is returning through Mexico, Ecuador, Peru, and Chile.

Mr. Brady found that the movement for standardization of methods and materials, which took definite form some five or six years ago in Argentina and Brazil (the two countries of greatest industrial development in South America), is now spreading rapidly over the continent. In Uruguay, for instance, there is an active standardizing institute which has committees working on standards of such diverse character as is indicated by the following list:

bricks
cast-iron pipe
concrete pipe
design of concrete structures
windows and doors with steel frame and with wooden frame
tiles for floors
forms for concrete
fuel
highway materials
limes and cement
linseed oil
railroad ties
textiles
valves

This is typical of this country as well as larger countries. Very shortly it is expected that Chile will organize a similar Institute and there is already in existence (although not yet functioning actively) a Committee for South American Standards which aims at ultimately obtaining uniformity throughout the continent.

Many Standards Already Issued

The Argentine Standards Institute (IRAM) has already issued some 60 or 70 standards, applying mainly to imported materials. The Brazilian Institute (ABNT) has issued a similar number, and in the State of Sao Paulo the State's Technological Institute has already prepared a great many standards. The Brazilian work is mainly directed at local manufacture, which is making great strides.

The machinery for developing standards in these countries is set up to assure that their action on standards will be fair to all concerned and that all groups will have an opportunity to present their viewpoints before standards are adopted. U. S. business interests in South America usually have so few technical men on their staffs that it is impossible for them to release men for work on standards committees. For this reason the North American viewpoint is frequently not effectively represented. The British and Germans, on the other hand, both have staffs of engineers who can be assigned to committee work and who represent the viewpoint of industry in these two countries. Despite this disadvantage it is still possible for our manufacturers to present their viewpoint before standards are finally adopted because of the well-established policy of issuing standards tentatively for some six months before final adoption. One of the important tasks which Mr. Brady expects to undertake will be to bring such proposed standards to the attention of the industries concerned before this trial period expires.

It is to be hoped that criticisms will be forthcoming from the groups concerned well within the time limit. Owing to delays in communications, censorship, etc., time will be a determining factor in whether our point of view will have a chance of being considered.

U. S. A. Business Vitally Concerned

The interest of the U. S. A. businessman in standardization in these great industrial markets is obvious. When normal imports are resumed, our exporters will find their products must conform to the Argentina standards. In Brazil we will be engaged in manufacture, and it is to our interest that the standards sharply define the quality of products. Cooperation with the existing Institutes, and with those that will be established in the future, is thus of direct importance to the industry.

Mr. Brady urges manufacturers in this country to support the efforts of the American Standards Association to give such cooperation. In particular he points out that the field is a vast one and that it requires much greater and more concentrated effort than can be made with the means now available. British and German businessmen have long recognized this need, and have gone to much greater lengths than we have done in the field of promoting their common interests. Although the war has temporarily ended German export business, it has given just that much more time and opportunity for their local men to study how the standardization movement may redound to their advantage.

New War Standard Fills Long-Felt Need

Covers Panel-Type Electrical Indicating Instruments

by R. B. Shepard[1]

Chairman, War Committee on Electrical Indicating Instruments

ONE of the most troublesome problems in the manufacture and maintenance of communication and electronic equipment as well as of electrical control apparatus has been the lack of standardization of 2½- and 3½-inch panel-type electrical indicating instruments.

With instruments in insufficient supply because of tremendously increased needs far exceeding the pre-war capacity of the instrument industry, equipment manufacturers have found it difficult to maintain alternate sources of supply because of the lack of instrument interchangeability. Likewise, it has been difficult for the War Production Board to divert instrument production to the most urgently needed equipment for this same reason.

Meanwhile, instrument producers have been handicapped by a multiplicity of orders for instruments basically the same but varying in the superficial details of external design.

At the request of the War Production Board, the ASA War Committee on Electrical Indicating Instruments undertook to clarify the situation in a new standard for Electrical Indicating Instruments, 2½- and 3½-Inch Round, Flush-Mounting, Panel-Type (C39.2-1943), which was approved as American War Standard on January 8, 1943. The standard is written in Federal Specification form so that it may be used directly for procurement purposes by government agencies.

Even before its approval, this standard in its printed draft form was being used as a guide for the expansion of the instrument industry. A scant eight days after its promulgation it was approved by the Signal Corps Standards Agency for procurement purposes in lieu of former Army specifications. Similar action is expected in the very near future from other branches of the Armed Forces and other government agencies.

The new standard not only provides for interchangeability of instruments, which will facilitate production and avoid maintenance of unduly large stocks of spare instruments in both Army and Navy repair depots scattered from Iceland to the islands of the South Pacific, but it also sets up a single standard of performance for instruments manufacturers to meet instead of the many different specifications, issued by prime contractors and government agencies in the past.

Courtesy Westinghouse

This view of a rectifier type indicating instrument shows the rectifier, mechanism, magnet and base.

Only round, flush-mounting, molded-case instruments have been selected for standardization by the War Committee. Rectangular instruments, furnished by instrument manufacturers as the result of peace-time pressure of overly style-conscious equipment designers, were unanimously discarded for war-time use by both the Armed Forces and the industry members of the committee. These cases use more molding material, take longer to mold, use additional brass in mounting studs, necessitate drilling an extra hole in equipment panels, and are often cracked by unequal tension on the mounting studs.

Front-of-board mounting instruments and clamp-mounting, narrow-rim instruments were likewise eliminated from consideration since they are seldom, if ever, needed on properly designed equipment.

Metal-cased instruments are not included since, in the few cases where shielding is necessary, simple light-weight shields used with standard instruments can serve adequately. Unnecessary use of metal-cased instruments has wasted much brass and also necessitated many service replacements because of a tendency to incur cover-glass cracks through their zero adjuster openings.

[1] Chief, Simplification Branch, War Production Board.

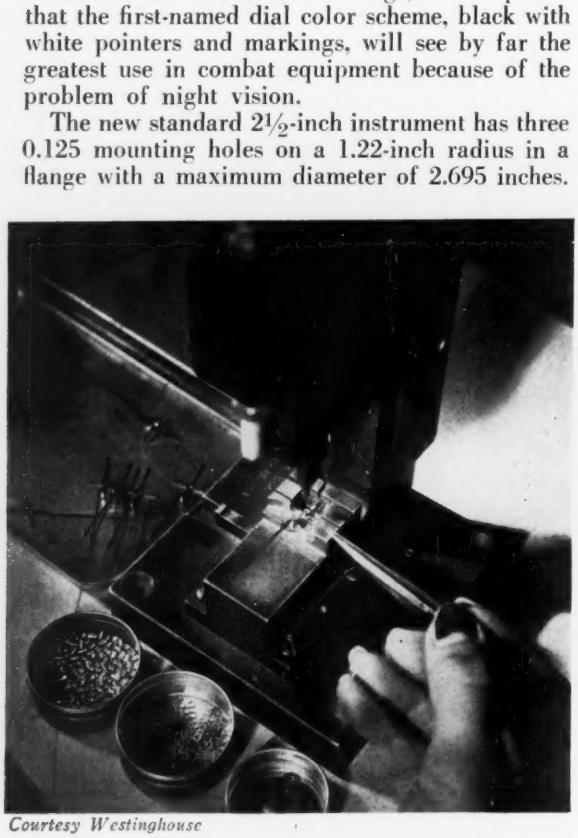
Significant also in the new standard are the universal type designations assigned to each instrument listed. These part numbers will be used by all of the Armed Forces and others using the new standard. In this way instruments can be diverted from the production lines to the equipments in which they are most needed and the Armed Forces can obtain interchangeable spare instruments with the same part numbers from each others' stocks.

Letters and Numerals Standardized

Standardized also in this specification are the letters and numerals used for scale identification. The type of figures and letters used is that first originated by the Materiel Center of the Army Air Forces in its design standard AND-10400 for use on aeronautical instruments. The committee found it advisable to extend the use of these characters to all panel instruments. The new standard letters and figures are clear and legible under all conditions of illumination and types of dial color schemes.

Recognized as standard color schemes for dials are black with white pointers and markings, white with black pointers and markings, black with fluorescent pointers and markings, and black with radio-active luminescent pointers and markings. From the standpoint of the Armed Services as indicated at the committee meetings, it is expected that the first-named dial color scheme, black with white pointers and markings, will see by far the greatest use in combat equipment because of the problem of night vision.

The new standard 2½-inch instrument has three 0.125 mounting holes on a 1.22-inch radius in a flange with a maximum diameter of 2.695 inches.



Courtesy Westinghouse

Here, pointers and springs for electrical indicating instruments are being assembled.

The depth of the instrument back of the flange has been set at a maximum of 1.60 inches for all except a-c instruments for which a depth back of flange of 1.75 inches maximum is shown. This depth was deliberately chosen to obviate retooling and redesigning of instrument mechanisms by established instrument producers.

The committee has carefully pointed out in this standard that while instruments having a depth of as little as 1 inch are commercially available, they are available only in very limited quantities. The question of a depth of body back of flange has probably been one of the most critical as far as the Armed Forces are concerned, especially in the maintenance and production of their compact combat communications and electronic equipment. In this case designers have impeded both production and maintenance by their design around the shallowest instruments without allowing sufficient space for use of deeper instruments which have been more readily available.

The radius of the mounting holes in the new standard was chosen on the basis that an instrument with this dimension is now available from all established instrument manufacturers, while instruments with this mounting hole radius at 1.16 inches, which have been next in popularity, are available only from a limited number of manufacturers. Molds having this smaller flange can be converted to the larger flanged case if necessary.

In the case of the 3½-inch instrument, the standard instrument has three 0.150-inch mounting holes on a 1.58-inch radius in a case having a flange diameter of 3.5 $\pm$ 0.01 inches with a maximum body depth back of flange of 1.66 inches. As in the case of the 2½-inch instruments, shallower instruments are available but the 1.66-inch figure was chosen as most practical from a production standpoint. Instruments of these dimensions have long been the standard of the Armed Forces and are available from practically any manufacturer in the industry, while the 3⅜-inch flange diameter instrument with a 1.53-inch mounting hole radius and the 3¼-inch flange diameter instrument with a 1.5-inch mounting hole radius were available only from a limited number of manufacturers.

Set forth in this standard for the first time is a goal for the location and size of instrument studs. After careful consideration, the committee chose a 1-inch spacing of 0.69-inch long ¼-28 NF-2 studs on the horizontal instrument center line as the ideal instrument terminal stud location and spacing. However, this has not been made overly restrictive in the standard. Certain variations have been allowed in order not to necessitate retooling by a large portion of the industry. The committee has taken pains in this standard to indicate that in any redesign of existing instruments or in new designs, every effort should be made to maintain this stud size location and spacing.

The standard ranges for instruments shown in

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S. K. Wolf, *War Production Board, Radio and Radar Division, Components Section*
(H. P. Rockwell, Alternate)

Copies of the American War Standard on Electrical Indicating Instruments (2½- and 3½-Inch, Round, Flush-Mounting, Panel-Type) (C39.2-1943) are now available from the ASA at 50 cents.

the specification have been chosen by the committee as only those for which a large demand has existed and consequently desirable for inclusion in this standard. However, from time to time certain changes may be made in these lists of standard instruments as need may arise for a special instrument in sufficiently large quantity to make it worthy of recognition in this standard.

It is not intended that the manufacture of panel-type instruments which do not conform to this standard be immediately discontinued. Existing designs under which equipment is being, and will continue to be, fabricated are such as not to complete substitution with instruments included in this standard. Neither is this standard suitable in all cases for direct replacement of existing instruments which may fail in service since, as has been pointed out previously, standard instruments are not in many cases interchangeable.

The performance requirements of the new standard have been based for the most part on the excellent Navy Department Bureau of Ships Specification 17-I-12 (INT). Certain other features have been based on tentative U.S. Army Specification 71-515B, issued by the Signal Corps.

In addition, a shock test is included for the first time in any widely used instrument specification. The shock test included is based on a method originally developed by the National Bureau of Standards of the Department of Commerce and on which much work has been done by the Weston Electrical Instrument Corp.

The performance characteristics of instruments produced under this specification are such that the instruments will withstand exposure to the extremes of temperature, humidity, vibration, and shock encountered in the most severe military service, except that of direct mounting on aircraft instrument panels for which the Army Air Forces have developed their own specifications.

Most of the detail of preparing this standard since the committee was first organized last July has been ably carried out by a drafting group headed by its secretary, John W. McNair, ASA Electrical Engineer. The members were John H. Miller of the Weston Electrical Instrument Corporation, J. M. Whittenton of the General Electric Company, and D. A. Young of the Westinghouse Electric and Manufacturing Company; Ellsworth F. Seaman and B. R. Boymel of the Navy Department, Bureau of Ships; F. K. Priebe of the Fort Monmouth Signal Laboratory; Sol Zaretsky of the Office of the Chief Signal Officer, and S. L. Chertok, ASA Staff Engineer. Other members of the committee and interested parties met with the drafting group from time to time.

As a result of the committee's work, various laboratories are engaging in research on the effect of high temperature and high humidity on miniature instruments, on the effect of vibration and shock on these instruments, and on the question of high frequency error in miniature radio frequency instruments of the thermo-couple type. As a result of their investigation, certain changes may be made in the standard when more complete knowledge on these subjects is obtained.

British Plant Praises Simplification Results

Simplification, for speeding production through more effective use of tools, labor, space, and materials, as well as for conservation of materials, is fast becoming a war weapon of outstanding importance. In Great Britain as well as in the United States, the effects of the simplification program are being widely recognized. This advertisement issued by Cadburys of Bournville, England, points out the results of simplification in one British plant. (See below.)

SIMPLIFIED PRODUCTION

Cadburys feel it may be of general interest to publish the following facts.

As compared with pre-war:

PRODUCTION at Bournville of Chocolate and Cocoa has fallen by only 13%
and a considerable proportion of this is for Service requirements

BUT

LABOUR used in the manufacture of Cocoa and Chocolate has been reduced by 40%

AND

FACTORY SPACE released is more than 20%

PAPER AND CARD used for wrapping purposes have been reduced by 50%

How has this been done?

The answer is *simplification.* We have stopped making Assortments and have concentrated on the manufacture of Cocoa, Moulded Chocolate, Bournvita, Filled Blocks and Chocolate Biscuits.

Before the war we made
99 LINES — 237 PACKINGS

This has now been reduced to
16 LINES — 29 PACKINGS

¶ We submit this record of our experience to show how by simplification it is possible to produce the maximum amount of goods with the minimum of labour, space and materials.

ISSUED BY
CADBURYS
OF BOURNVILLE

American Standards Revised

Several American Standards for which the American Society for Testing Materials is proprietary sponsor have been revised and brought up-to-date in accordance with current technological practices. These revisions, approved by the American Standards Association, are as follows:

Forged or Rolled Steel Pipe Flanges for General Service (ASTM A181-42) Revision of American Standard G46.1-1942 25¢

Gypsum

Gypsum Lath (ASTM C37-42) American Standard A67.1-1942 25¢

Gypsum Wall Board (ASTM C36-42) American Standard A69.1-1942 25¢

Gypsum Sheathing Board (ASTM C79-42) American Standard R68.1-1942 25¢

Test for Gypsum and Gypsum Products (ASTM C-26-42) American Standard A70.1-1942 25¢

Materials for Boilers, Pressure Vessels, etc.

Molybdenum-Steel Plates for Boilers and other Pressure Vessels (ASTM A204-42) Revision of American Standard G34.1-1942 25¢

Low-Carbon Nickel-Steel Plates for Boilers and Other Pressure Vessels (ASTM A203-42) Revision of American Standard G33.1-1942 25¢

Sampling and Analysis of Coal and Coke (ASTM D271-42) American Standard K18-1942 25¢

Structural Steel for Locomotives and Cars (ASTM A113-42) Revision of American Standard G39.1-1942 25¢

Copies of these standards may be obtained from the American Standards Association, 29 West Thirty-ninth Street, New York, N. Y.

British Recommend Research To Use Different Paint Materials

A war emergency specification for Priming Paint (Lead Base) just issued by the British Standards Institution carries a recommendation by the committee in charge that paint manufacturers initiate research at once with a view to producing similar paints using any alternative materials which may be available. The recommendation is made by the committee in view of the ever-changing situation in connection with raw materials.

The emergency specification covers five types of paint, including air-drying and stoving finishes which can be applied by brush, dipping, or roller brushing. Each type should contain a minimum of 5 per cent red lead, the standard provides.

On the whole, it is explained, the specification covers performance rather than composition, and this allows the "formulative ingenuity of the paint chemist full play."

Performance tests are included designed to evaluate the paint on a practical basis. The air-drying paints should dry hard in five hours at 15.5—21 C. One test is designed to evaluate the anti-corrosive properties of the dried film.

Standard Markings Identify Contents of Cylinders for Compressed Gas

by H. G. Lamb

Safety Engineer, American Standards Association

MANUFACTURERS and users of compressed gases can now request that cylinders for holding different types of gases be marked according to the new American Standard method.[1]

A wide variety of gases are compressed and sold in cylinders—oxygen, acetylene, hydrogen, chlorine, carbon dioxide, nitrogen, and gases for refrigerants, among many others. If mixed with other gases many of these may create explosions, fires, or dangerous health conditions. It is therefore important to any user to be sure his cylinders are legibly marked so that he does not accidentally mix two unlike gases. Many large users of compressed gases pipe the gas throughout their plant and supply this system by connecting several cylinders to a single manifold pipe. It is highly important in these cases that no other gas be allowed to enter or contaminate their system. In some cases, too, gases originally manufactured for industrial use may in an emergency be diverted to medical or public health uses. An emergency supply of oxygen, for example, may be needed suddenly in a hospital and cylinders rounded up from many different sources; or chlorine will be needed in unusually large amounts to purify a public water supply.

Unless the contents of the cylinders are legibly indicated in such a way that the markings cannot easily be changed or obliterated it is quite possible for serious errors to occur under such emergency conditions.

How to Mark Cylinders

Since each gas producer usually paints all cylinders belonging to him the same color, regardless of the kind of gas enclosed, it is important that some standard system be used by which the content of the cylinders can be easily and accurately recognized. The size of the problem may be seen in the fact that as far back as 1940 it was reported that 40,000,000 compressed gas cylinders were in use in the United States. Undoubtedly this number has been greatly increased during the past two years.

The standard just approved by the American Standards Association provides that compressed gas cylinders shall be legibly marked to identify the chemical or the trade name of the gas by means of stencilling, stamping, or labelling. The marking wherever practical is to be on the shoulder of the cylinder and is not to be readily removable. The height of the lettering in relation to the diameter of the cylinder is specified.

Oxygen Containers Standardized

The standard calls attention to the National Bureau of Standards' Safe Practices Recommendation R 176-41, Color Marking for Anaesthetic Gas Cylinders. It also calls attention to the Interstate Commerce Commission Regulations which provide requirements for styles, sizes and markings for safe transportation of explosives and other dangerous articles. Food and Drug Administration regulations provide that gases not suitable for human consumption must be so marked, and the standard, therefore, also calls attention to those regulations.

Incidentally, it may be noted that this latter regulation has resulted in the manufacture and sale of oxygen which now is suitable for human consumption whether it is intended for industrial use or for use in a hospital. For this reason, all the oxygen on a battleship (whether intended

Courtesy Linde

Danger of accident is averted by proper marking of these gas cylinders.

[1] American Standard Method for Marking Compressed Gas Cylinders to Identify Content (Z48.1-1942) 10¢

for welding purposes or for hospital purposes) can be used for emergency treatment of wounded sailors; or in a great tragedy such as the recent Boston night club fire oxygen cylinders can be commandeered from industries of all types for treatment of the seriously injured.

Problems Encountered

Preparation of the standard has been under way for some time. In May, 1925, the Industrial Accident Commission of California made a formal request to the American Standards Association for the initiation of a project on Standardization of Color Markings on Compressed Gas Equipment, Cylinders, Manifolds, and Hose. Inquiries were made of the War Department, Navy Department, the National Safety Council, and others, and it was the consensus that a definite need for such safety standards existed. In addition, the War Department stated that the standardization of valve threads for compressed gas cylinders was also needed.

It developed, however, that serious objections existed to the use of standard colors to identify gases. These objections came from the manufacturers of the gases, in view of the fact that individual companies were using specific colors which had become more or less their trade marks and that any change in this system would mean not only a loss in this type of prestige, but would also be a great inconvenience to their truckmen in collecting cylinders for refilling.

A conference of those concerned was held in January 1940, and since there was so much objection to a color standard, it was suggested that some other means of identification be provided. It was agreed to ask the Compressed Gas Manufacturers Association to submit the association's recommended practice for marking cylinders for consideration as an American Standard. A second conference was held early in 1942 to consider the recommendations submitted by the Compressed Gas Manufacturers Association. The principle of the Association's recommendations was accepted by the conference and a draft standard was prepared and sent to a general canvass of all groups concerned. This canvass showed that the standard was acceptable, and it was therefore approved by the Standards Council on December 8.

It has been agreed that any further revision of the standard shall be by the sectional committee method.

British Publish Standard On Quality Control Charts

HOW to construct and use Quality Control Charts in applying statistical methods to control the quality of a product during production is described in Part 1 of a revision of publication No. 600:1935, just issued by the British Standards Institution. The 1935 publication, entitled *The Application of Statistical Methods to Industrial Standardization and Quality Control*, was prepared by Dr. E. S. Pearson following a series of lectures given by Dr. Walter A. Shewhart, Bell Telephone Laboratories, at the University of London. The book presented a comprehensive discussion of the application of statistical methods to industrial standardization.

A revision of the 1935 edition of this book was considered in 1939 but was postponed when war was declared. Recently, however, there has been a pressing demand for a guide to use in controlling quality in British war production. Since the type of No. 600:1935 has been destroyed by German bombs and it is impossible at the present time to undertake a complete revision, the BSI has met the urgent demand for information by issuing a handbook describing the construction and use of Quality Control Charts. This handbook, known as B.S. 600R:1942, is Part 1 of a revision of No. 600:1935 to be completed some time in the future. Simple problems involving the use of Control Charts are included and discussed in the text and in the appendices.

About a month before the handbook was issued, the British Standards Institution published War Emergency Publication No. B.S. 1008:1942, Guide for Quality Control and Control Chart Method of Analyzing Data. This is a reproduction, by permission of the American Standards Association, of the American War Standards Z1.1-1941 and Z1.2-1941, bearing the same titles.

When a third American War Standard in this field, entitled Control Chart Method of Controlling Quality During Production (Z1.3-1942), was completed last April, the ASA offered the British Standards Institution permission to reprint this standard also as a British War Emergency Standard. According to the latest information received by the ASA, however, the BSI does not intend to reprint this standard for the time being and instead has purchased 250 copies of the American War Standard (Z1.3-1942) together with 250 copies of the Manual on Presentation of Data published by the American Society for Testing Materials.

American Standard for Pipe Threads Is Revised and Enlarged

by
Arthur M. Houser
and
C. B. LePage

THE American Standard for Pipe Threads in the form approved by the American Standards Association and published in October, 1942 records a number of refinements, some modifications, and a considerable number of additions to the first American Standard approved and published in 1919 as ASA B2-1919. These developments are the direct result of painstaking study over the years by the organizations and firms directly concerned with the manufacture and use of wrought iron and steel pipe, the manufacture of screwed fittings, and the gages for this product.

Reorganized Committee

The American Gas Association and the American Society of Mechanical Engineers originally sponsored this standard in 1918 and they reorganized Sectional Committee B2 which undertook the present revision.

The original proposal for standard pipe threads in the United States, which Robert Briggs made prior to 1882, set up the standard taper of 1 in 16 (3/4 in. to 1 ft), the formulas for the major diameter of the thread at the end of the pipe, and the tolerance on the length of the thread. The 1919 standard included a transformation of the formulas in terms of the pitch diameter of the taper thread at the end of the pipe, the addition of certain pipe sizes, the addition of tolerances on the dimensions, the tabulation of the dimensions and tolerances in more complete form, and the establishment of necessary practical details for the gages and gaging of this type of thread.

One important contribution which the 1919 standard made was the setting up of a truncation of 0.10p at the crest and root of the plug and ring pipe thread gages. Experience and tests had established the importance of the practice of gaging the flank of the thread, a practice which permits the gaging of threads made with tools after they have become slightly worn, and further, to facilitate the grinding of the flanks of the gages, it permitted the undercutting of the roots. Another important provision set up by this standard was the reduction of the tolerance on the diameter and length of the internal and external thread to one turn large and one turn small.

It will be realized, therefore, that the 1919 standard went a long way toward the practical application of the Briggs theoretical taper pipe thread to the needs of industry. However, many details were left for further study and actual experience with tools and gages and the more modern methods of measurement.

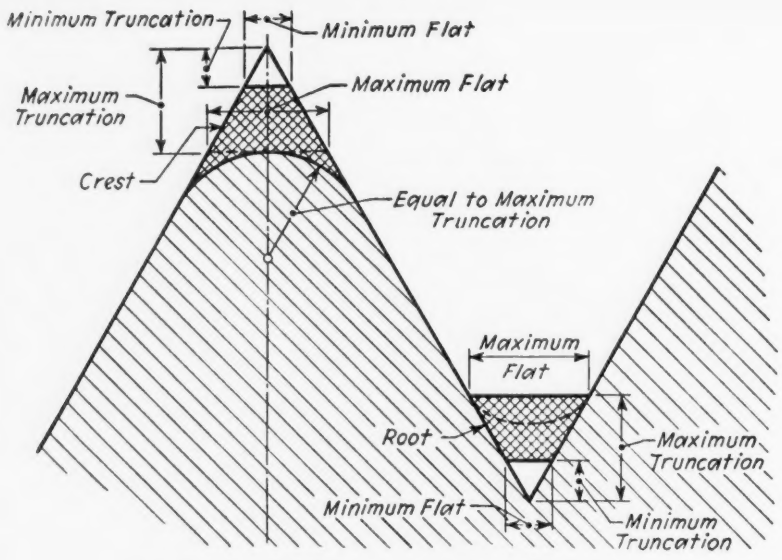
A stimulus to this process was given by the activity of the several standards committees of the American Petroleum Institute. Their work on a standard thread for oil-well casing and their development of further refinements in the threads used on API line pipe was a factor in furthering the art of making and gaging taper pipe threads. The satisfactory performance of this product called for the production of better threads than might be expected in the general run of threaded product based only on the 1919 standard. The strength and the tightness of the joint are the important considerations.

Studied Threading and Gaging Practice

During the period immediately preceding the present revision the federal government services, including the Army and the Navy, also developed specifications for pipe threads, and the pipe fitting industry made a detailed study of the threading and gaging of screwed fittings. The principal object of this study was to establish the necessary tolerances and threading practice which would produce tight joints with steel fittings. This called for closer workmanship than that required for other commercial fittings of cast iron, malleable iron, and brass.

These studies convinced the members of the committee that one important fundamental change

The American Standard for Pipe Threads (B2.1-1942) was developed under the sponsorship of the American Society of Mechanical Engineers and the American Gas Association. ASA Members are entitled to 20 per cent discount on all approved American Standards ordered through the ASA office. The American Standard for Pipe Threads is 75 cents per copy.



Limits on crest and root truncation of product

The values of the maximum and minimum truncations and the equivalent width of flats are given in the new standard

in the 1919 standard should be an increase in the truncation of the crest and root of the external and internal threads. The original standard had set a blanket truncation of 0.033p. So, after a considerable amount of discussion, this minimum truncation was increased to a maximum of 0.096p for 27 threads per inch and 0.073p for 11½ threads per inch. A complete table of maximum and minimum truncations and equivalent widths of flats are given in the new Table 2 of the 1942 standard.

Two tables of the 1919 standard were combined to make the new Table 3 "Tolerances for Reference and Working Plug and Ring Gages." All of the tolerances given in this table were carefully reviewed, and revised where necessary. Its principal use is in the preparation of specifications for gages.

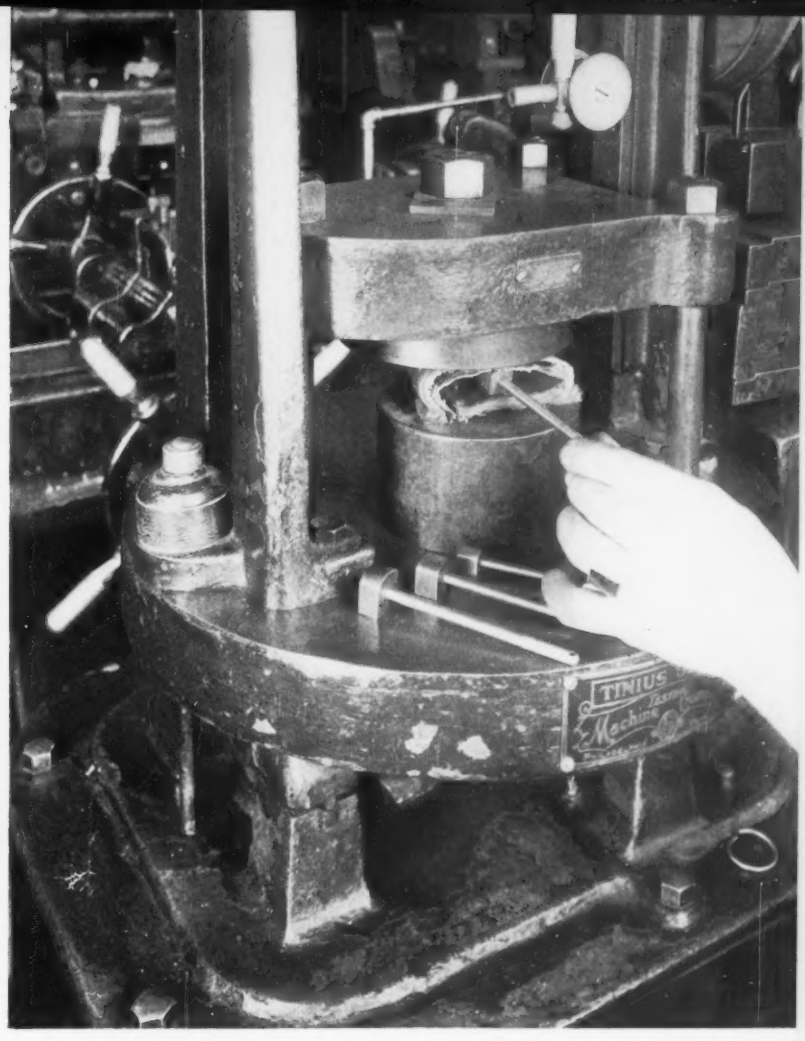
The section of the revised standard covering the specifications for *straight* pipe threads contains the greater part of the new material. This is grouped under five heads as follows:

Type 1 Pressure-tight joints for pipe couplings, Table 6
Type 2 Pressure-tight joints for grease cup, fuel, and oil fittings, Table 7
Type 3 Free-fitting mechanical joints for fixtures, Table 9
Type 4 Loose-fitting mechanical joints with locknuts, Table 10
Type 5 Loose-fitting mechanical joints for hose couplings (ASA B33.1-1935), Table 11

The limiting dimensions of these types of threads are given in tables and while in most cases this data has appeared in print in other publications this is the first time it has been gathered together in one publication. This statement applies also to the "Dimensions for External Taper Pipe Threads for Railing Fittings" which forms Table 12. This table is based on a standard prepared by the Manufacturers Standardization Society of the Valve and Fittings Industry. When applied to both the pipe and the fitting this thread provides a strong mechanical joint with all of the threads of the joint covered, thus taking advantage of both appearance and strength.

Confusion Eliminated

The extent of the cooperation enjoyed in the preparation of this revised standards pamphlet is indicated by the method in which the second appendix was developed. This appendix covers "Definition of Symbols Employed in Designating the Dimensions of Taper Thread Elements." The tentative draft of this section was prepared by a committee of three representing the National Bureau of Standards, the American Petroleum Institute, and Sectional Committee B2 on the Standardization of Pipe Threads. Up to the time this list of letter symbols was agreed to each of these three cooperating groups and other interested firms used different lists of standard letter symbols for taper pipe thread elements, which led to no small amount of confusion in the use of the publications having to do with taper and straight pipe threads. From now on this confusion should be gradually reduced. The committee believes, accordingly, that this list of letter symbols constitutes a real contribution to the piping industry and hopes that, when it has had a period of trial, it may become an integral part of the standard.



Courtesy General Electric Company

Performance tests, as well as savings in critical materials, are provided in the new American War Standard for Safety-Toe Shoes. Compression tests under loads of 3,000 pounds are carried out by this type of machine.

War Standards for Industrial Safety Shoes

by

Morris L. Chandross

Standards Division, Office of Price Administration

and

Arthur J. Truelson

Safety and Technical Equipment Division, War Production Board

AT the same time that luxury consumer goods were becoming scarce in this country as a result of war needs, war-induced shortages of critical materials were exerting pressures also on the production of equipment needed to maintain the flow of war material. These pressures squeezed consumer goods, and threatened the protective equipment needed to keep labor at its vital post and at maximum effectiveness. This occurred while we were faced with the greatest labor need for safety equipment in the history of industry, and, too, at a time when labor surveys were indicating the urgency of holding personnel at the peak of its productive capacity and of keeping it on the job. It became evident early in the war effort that the maintenance of safety standards consistent with the highest standards of experience was more essential than ever before to the achievement of this goal.

The development of standards for protective occupational footwear was one of the steps undertaken as a result of these pressures.

Surveys of supplies of leather and also steel (used in the protective toe) indicated the extent to which shortages existed in these raw materials

Courtesy North American Aviation Co.

A 1200-pound piece of steel fell on this man's foot. Thanks to the safety-toe shoe he wore, he was protected from serious injury.

and highlighted the necessity for setting performance and construction standards for safety shoes.

Accordingly, the Government agencies charged with responsibility in this field, the War Production Board and the Office of Price Administration, made plans for the development of standards for safety shoes through liaison with the American Standards Association which had previously been active in this field and which, through its Committee Z41, had already done some exploratory work in this regard.

Perhaps the best summation of the limiting factors as well as the guiding principles of this work is contained in the scope adopted for the project, namely:

1. To develop classifications of safety shoes by functional use, together with specifications therefor, using materials currently available; *e.g.*, leather not earmarked as suitable for military use; carbon steel; reclaimed rubber;

2. To use currently recognized test methods and procedures in arriving at standards, rather than take time to develop new or additional impact and bending tests, etc.;

3. To eliminate types, varieties and styles of safety shoes which are not vitally needed during the emergency period.

War Needs Considered

Thus, committee deliberations were tempered by considerations of war need of industry's experience, and of engineering technology. On December 11, 1942, American War Standard Specifications for Men's Safety-Toe Work Shoes (Z41.1-1942) was approved by the American Standards Association. It marks the completion of the first of the specialty safety shoe projects undertaken by the committee.

The new specifications provide uniform requirements for the production of safety-toe work shoes and include performance requirements for the steel toe-box. They do not limit production to one type of construction only but permit several types which have been found in practice to offer satisfactory protection and service to the wearer. Due attention has been paid, however, to the need for conserving critical materials, particularly leather and steel. Requirements for the strength of a toe-box under test have been included in national specifications for safety shoes for the first time.

This program is but one of the measures being employed in the effort to make suitable protective equipment available to workers; to effect savings in manpower by a reduction in lost-time accidents; and to save critical materials by concentration of production within ranges of maximum serviceability and minimum expenditure of vital materials. The technique of producing the maximum amount of commodities out of the limited and allocated supply of materials and labor must, in the field of safety equipment, be coupled with the maintenance of standards of protection previously extant, even though certain materials are now scarce or no longer available. It implies stretching supplies by cutting frills; by making one type of safety equipment do the work of two or three; in short, by limiting specifications so that the safety equipment produced offers functional service only.

Performance Most Important

In following this counsel, it is necessary to take stock of the safety devices held vital to plant operation and consider them in the light of the basic performance they are expected to yield rather than the miscellaneous functions exacted of them. These are basic and fundamental concepts. Yet, reviewing the field of safety equipment, one finds many practices that are accepted merely by reason of their use through the years, long after they have outgrown the specific functional needs that may have existed. Traditional use, for example, is often confused with, and for, the basic need for the device.

As an example, it had been represented to a committee working on welders' shoes that a welder's boot is a prime need for protective footwear for welders in the ship-building industry. Indeed it had been stated that smooth operations could not be expected if this vital safety equipment were unavailable. (A welder's boot is a special boot having a built-in protective toe box.)

There is no question as to the need for safety footwear for welders, but there is some doubt as to the need for a specific type which differs from those being worn in industries where heavy objects are handled. A field trip involving the inspection at first hand of welding operations of several major shipyards revealed that practically none of the welders were wearing the

welders' boots. Most of those who were adequately protected wore regular safety shoes (6-in. laced shoes having a built-in protective toe-box.) Many had never heard of welders' boots. However, in fairness to the argument for a specific type of shoe, it must be stated that these shipyards were in the eastern areas. In the West, on the other hand, use of the welders' boot is much more pronounced. Yet the welding operations are exactly the same, the type of personnel relatively the same, the protective need the same, and there is no higher accident rate with the eastern shoe than with the western. Here is a case where the geography or sectional differences in location are the determinants.

Maximum Production Needed

In a period of limited supplies where the optimum production must be obtained from available material and manpower, it is inconsistent to indulge the fancies and vagaries of preferences that cannot truly be classified as functional musts. Yet none can criticize the existence of established standard specifications not consistent with these aims. These were developed during the periods of peace—during periods of relative plenty. They sprang from genuine needs and could not wait for agreement of large groups on a national scale to decide the merits or advantages of inclusion of any particular feature. These then were evolved to fulfill specific functional uses. In so doing, even though an expenditure of additional materials was involved, they fulfilled their purpose.

The heterogeneous array of safety shoes, for example, typified a development of safety equipment engineered to fulfill specific requirements and yet, because of the individual approach which arose from plant needs, they appeared as different and differing products designed to serve the same use. Since group consideration could not be given each new product, the advantages of inter-change and inter-play of ideas were lost. In short, the learning and the "know how" that had been acquired by some sections of industry were not available to others who perhaps had achieved greater development in other phases of the problem. This in itself is one of the most powerful arguments for group development of standards through a unified effort.

Women's Safety Shoe Standards

Typical of an approach that could be operated in this way is the one utilized by the committee in its recent development of standards for women's safety shoes. No women's safety-toe shoes offering the same degree of impact protection as men's shoes have been produced at this writing. (For the purpose of a definition, this may be classified as a shoe containing or incorporating in its construction a toe guard capable of withstanding a static load of not less than 3,000 pounds.) The

The ASA War Committee on Protective Occupational Footwear (Z41) has prepared five standards for Men's Protective Occupational Footwear, as well as one for women's safety shoes. The standards for men's shoes are being published in one document; the one for women's shoes will be printed separately. The six new standards will cover:

Safety-toe shoes for men
Conductive work shoes for men
Electrical hazard shoes for men
Explosives operations (powder) shoes for men
Molders' safety-toe shoes for men, and
Women's safety-toe oxford shoes

Proposals to develop specifications for women's conductive shoes, women's welders' shoes, and women's explosives-operations (non-sparking) shoes are being studied by the committee.

Major E. R. Granniss, C.M.P., chief of the Accident Prevention Section, Office of the Provost Marshall General, U. S. War Department, is chairman of the ASA War Committee. Other members of the committee are:

George Dick, Melville Shoe Corporation; L. A. Tremblay (*alternate*)
W. E. Emley, National Bureau of Standards
R. C. Erb, J. F. McElwain Company; A. C. Blunt, Jr. (*alternate*)
J. H. Gimblett, International Shoe Company
H. J. Griffith, Jones & Laughlin Steel Company
E. B. Landry, Shore Establishments Division, U. S. Navy Department; H. G. Desjardins (*alternate*)
H. L. Miner, E. I. duPont de Nemours & Company
Major W. J. Niederauer, O.D., Safety and Security Branch, Office of the Chief of Ordnance, U. S. War Department; W. M. Wiesenberg (*alternate*)
G. E. Sanford, General Electric Company
T. F. Whalen, National Conservation Bureau
A. A. Williams, Safety First Shoe Company

M. L. Chandross, Standards Division, Office of Price Administration; H. C. Mesch, Safety and Technical Equipment Division, War Production Board; and A. J. Spring, Textile, Clothing, and Leather Branch, War Production Board, are liaison members of the committee.

H. M. Lawrence, ASA staff, is serving as secretary.

It is expected that the six new American War Standards for Protective Occupational Footwear will shortly be available.

influx of women to heavy industry is great, and the need for insuring the uninterrupted functioning of this labor supply by protecting these women from one of the commonest of lost-time accident causes—the falling object foot accident—is even greater. Here, too, are problems of style psychology; of advertising claims for the non-functional footwear supposedly adaptable to plant use; and, of course, the problem of the recommendation of anything uniform which is so often erroneously interpreted as regimentation, especially by women.

New Field an Advantage

However, the very lack of production of these women's shoes has offered advantages to the standards makers. When their work was started, individual production had not yet been undertaken. Lasts, dies, and equipment had not yet been purchased. Therefore it was not necessary to scrap existent equipment and materials in an effort to achieve standardization. This consideration, the need for new machines to replace old ones, while merely costly during normal times, is virtual folly in wartime. With productive capacity strained under the tension of manufacturing war goods, the added load must be measured in terms of its importance to the world conflict, and must not fail to balance the production being displaced, in terms of its contribution to the total war effort.

In women's safety shoes there were no individual sales specialties that had to be scrapped and no individual investments that would be jeopardized by changing products, or by losing style identity. The latter was more of a factor in the field of women's footwear (whether safety or not) than in any other standards activities ever undertaken by the group working on standards for safety shoes.

With all this in its favor, the committee could build from the ground up—and build on the basis of a common starting line. It could examine the experiences in similar commodities in a group. It could review with open mind the evidence submitted in favor of one or another type of construction; the argument for limitation to one style and one color; the pros and cons for the selection of a specific weight and grade of leather lest the steel built into the toe be wasted in a poor wearing shoe. Not that these considerations are rendered simple by the lack of previous production, for it can be argued that an untried commodity was being standardized before it had been seen in action. The opportunity to learn from and to correct errors in previous production was not present, but the group experience of manufacturers, users, and engineers available to the committee was of even greater importance to it. The undertaking then was auspicious in the open group thought accorded it, and in the inter-play of ideas garnered from closely allied fields. Through this work, standard specifications have been developed for a single type of women's safety-toe protective shoe, designed to meet all of the functional requirements expected of it.

The test of time will determine the advantages to be gained by this approach. Experience in other fields is encouraging to the belief that it will be favorable, for in its development a composite exposition of the skills of industry and technology, in harmony with the limitations imposed by war shortages and the necessary price considerations, is represented.

ASA Approves Commercial Standard On Gas Floor Furnaces

Approval of the American Standards Association has just been given to Commercial Standard CS99-42 on Gas Floor Furnaces—Gravity Circulating Type, issued by the National Bureau of Standards.

The chief purpose of the standard is to establish minimum specifications for the guidance of manufacturers, distributors, and users of gravity circulating type, natural draft gas floor furances, with particular reference to sizing and installation requirements; to avoid delays and misunderstandings; to record the sizes most generally available, and to provide a uniform basis for guaranteeing compliance by the use of labels or certificates.

It includes definitions, appliance construction requirements, sizing, placement, general installation requirements, venting, gas connections, guarantee, certification and labeling.

It is expected that through the establishment of the standard and through the use of guarantees of compliance issued by the manufacturer and by the installer, the consumer will receive improved performance, a higher degree of safety and greater satisfaction from gas floor furnaces. The standard will also provide a basis for conservation of materials and labor in the sense that both the purchaser and the War Production Board have means for distinguishing between gas floor furnaces which will perform satisfactorily and those which are poorly constructed, even dangerous, and might have to be replaced after a short period.

Copies of the standard are available from the Superintendent of Documents, Government Printing Office, Washington, D. C. at five cents.

ASTM Issues 32 New Standards And Methods of Test

13 Are Emergency Specifications

THROUGH action of its Committee E-10 on Standards, which in the interval between meetings can act for the Society and which must approve all emergency standards, the American Society for Testing Materials recently issued some 32 new standard specifications and test methods. Of these, 13 are emergency specifications and tests designed to expedite procurement or conservation of critical or strategic materials. All of these new specifications are being printed in separate pamphlet form (the emergency specifications on pink stock) and copies can be obtained at 25 cents each from the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, Pa. They will also be bound in the 1942 *ASTM Book of Standards* now in preparation.

One important emergency specification, ES-20, covers malleable iron flanges, pipe fittings, and valve parts including parts to be assembled, manufactured in advance, and supplied from stock by the manufacturer or distributor. Processes of manufacture are covered; tests specified to be in accordance with the materials specifications listed for Cupola Malleable Iron (A 195), or for Malleable Iron Castings (A 197), and finally marking requirements are given. In developing this standard Committee A-7 acted on a suggestion from the Conservation Division, WPB, that standardized requirements for these fittings would aid the substitution of malleable iron for copper in some valve parts, as well as substitution of iron valves for brass valves 2 in. or smaller. This shifting of material is urged to conserve copper.

Emergency Standards for Insulating Material

Twelve emergency specifications cover various types of thermal insulating material in different forms and for service at widely varying temperatures ranging from surface temperature of 200 to 1900 F depending on type of materials. The serial designations and brief titles are as follows:

ES— 8	85 Per Cent Magnesia Cement
ES— 9	Long Fiber Asbestos Cement
ES—10	Mineral Wool Thermal Cement
ES—11	Expanded or Exfoliated Mica Cement
ES—12	Diatomaceous Earth Cement (600 to 1200 F)
ES—13	Diatomaceous Earth Cement (1200 to 1900 F)
ES—14	Blanket Insulating for Building Purposes
ES—15	Blanket Insulating for Industrial Purposes
ES—16	Blanket Insulating for Refrigeration
ES—17	Preformed Pipe Covering
ES—18	Preformed Block Insulation
ES—19	Structural Board Insulation

The first six specifications cover material in the form of dry cement or plaster which when mixed with water can be applied and dried in place.

Revised Emergency Specifications

The ASTM also announces that approval has been given to modifications in the emergency specifications for carbon-chromium ball and roller bearing steels, ES-5, the changes permitting nickel and molybdenum contents of 0.35 and 0.08 per cent respectively, these being considered residual alloys. Requirements on maximum permissible decarburization and surface defects for wire and rods for cold heading are modified.

Emergency alternate provisions which can be invoked by the purchaser where considered satisfactory have been established in some 22 ASTM specifications, notably in the field of pipe and tubing. Many of the widely used specifications for boiler and superheater tubes, still tubes for refineries, and heat exchanger and condenser tubes are affected, since changes in chemical composition conserve critical alloys and other changes will expedite procurement and increase production.

An important emergency provision in the specifications covering carbon-steel forgings for locomotives and cars (A 236) includes two new higher strength classes with tensile ranges from 100,000 to 130,000 psi and elongation from 13 to 18 per cent. Standardization requirements for this material which can be used for main and side rods, straps, crank pins, etc., will assist materials engineers of a number of railroads whose designs call for this higher strength material.

Eighteen new tentative specifications and tests were developed in regular course by the various ASTM technical committees. The new recommended practice for making torsion tests of cast iron (A 260) covers the use of this method in connection with applications for crank shafts, couplings, and similar service. From the torsion test result, values for other important properties can be computed easily.

Three of the new methods, developed by Committee A-6 on Magnetic Properties, cover permeability of feebly magnetic materials, permeability and core loss of flat-rolled magnetic materials at low alternating inductions using 28-cm specimen, and permeability and core loss of flat-rolled magnetic materials using 28-cm specimen.

An extensive research and test program under way in Committee D-1 on Paint, Varnish, Lacquer, and Related Products in connection with the accelerated tests of preservative coatings has resulted in four new tentative methods for evaluating paints. These all apply to exterior paint of the linseed oil type and give methods of evaluating the degree of chalking (D 259), checking (D 660), cracking (D 661), and erosion (D 662). There has been urgent need for a uniform system of reporting deterioration of coatings which will now be provided by these standards.

A new specification for isopropyl acetate (D 657) covers low boiling solvents, the use of which has greatly increased due to the needs of the armed services for quick drying coatings.

Plastics

Three new tentative standards were approved as a result of active work in Committee D-20 on Plastics as follows:

D 695—42 T	Method of Test for Compressive Strength of Plastics
D 696—42 T	Method of Test for Coefficient of Linear Thermal Expansion of Plastics
D 697—42 T	Method of Test for Water Vapor Permeability of Plastic Sheets

The group of technologists representing leading consumers and producers of plastics on Committee D-20 has worked intensively to develop satisfactory tests. They have accelerated their work because the national emergency has stressed the necessity of adequate evaluation of these materials so critical in a number of uses.

Road and Paving Materials

Two new specifications were accepted on the recommendation of Committee D-4, one covering gravel for bituminous concrete base and surface courses, and one for water-bound base and surface courses. The mechanics involved were to incorporate in previously existing standards. which cover the use of crushed stone and slag. requirements on gravel and to issue these as new specifications. as follows:

D 692—42 T	Crushed Stone, Crushed Slag, and Gravel for Bituminous Concrete Base and Surface Courses
D 693—42 T	Crushed Stone and Crushed Slag for Bituminous Macadam Base and Surface Courses
D 694—42 T	Crushed Stone, Crushed Slag, and Gravel for Water-Bound Base and Surface Courses

Codes Show How to Protect Buildings Against Air Raids and Sabotage

Comprehensive measures to protect Federal buildings throughout the nation against air raid hazards and sabotage were announced September 3 by Brigadier General Philip B. Fleming, Federal Works Administrator. The codes were drafted by two Interdepartmental Committees organized under the direction of Commissioner W. E. Reynolds of the Public Buildings Administration, Federal Works Agency.

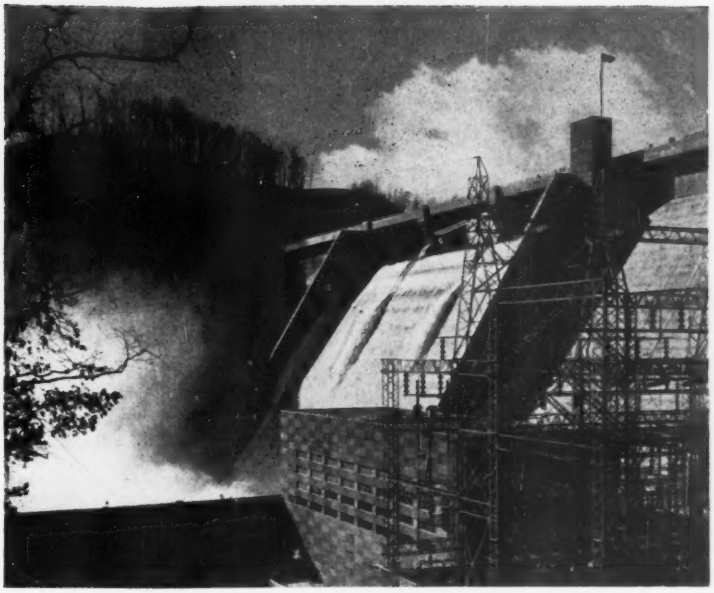
In many instances the prescribed measures have been in effect since December 1941, because it was necessary to proceed with the work before the committees had completed their studies.

The program is all-embracing in scope and deals with the construction of splinterproof shelters, roof and wall reinforcing against falling debris, prevention of escape of inmates from Federal prisons, insame asylums, leper institutes, and prevention of escape of dangerous animals. Two weatures are particularly noted: Gas protection and decontamination are not covered, and camouflaging of Federal buildings will be undertaken only when required by the military authorities and carried out under their direction.

Commissioner Reynolds stated that the protective measures are divided into three progressive Stages A, B, and C. The stage for a specific building will be determined, as provided in the codes, by the state of the hazard and its functional priority. The state of hazard will be determined by the Republic Buildings Administration. Each protective measure to be taken under the three stages of protection is defined in the codes. Among the precautionary measures to be applied as the degree of hazard increases are: Increased training and equipment of the service units, such as wardens, fire, first aid, utility and warning units and rescue squads; the removal of glass in shelter areas and also the subdividing of such areas. The protection of windows from blast and splinters is also required to protect essential continuing activities.

The guarding of the various buildings, identifying of the employees and public, physical protective measures, and other means of protection against subversive activities are covered in detail. In this connection it may be interesting to note that the American Standards Association is at present developing a new standard on the protective lighting of buildings which is expressly designed to aid in the continuous fight against sabotage and theft.

In order to assure complete cooperation of all government agencies in this protective program, representatives met in a conference with 20 previously trained field workers to reach a common understanding of their respective duties. These 20 men will be stationed at key points in the United States to aid in the necessary training.



Transformers play a vital role in bringing electric power from Norris Dam to the consumer.

Courtesy Tennessee Valley Authority

Important New Standards Cover Transformers, Regulators, Reactors

by V. M. Montsinger[1]

Chairman, ASA Sectional Committee on Transformers

THE Standards for Transformers, Regulators, and Reactors which were published in 1940 as proposed standards for a period of trial use have now been revised and brought up-to-date, and have been approved by the American Standards Association. They have now been published as fully approved American Standards for use by both manufacturers and users of transformers. Taken all together they are the most complete set of standards that have yet been published in the United States. They comprise not only the necessary information for purchasing specifications for the entire line of transformers, regulators, and reactors, but also include a complete Test Code, and Guides for Operation of Transformers.

These new Standards, which will unify practices, should be beneficial even in peace times, but should be even more valuable under present war conditions. The part relating to overloading, as given in the Guides for Operation, for example, enables a user to get the maximum service from his transformer.

The changes made in the proposed standards, which were widely circulated for criticism before the final standards were prepared, are the result of nearly two years of trial use. They are described in some detail below.

Section 1, on Definitions, has been revised and enlarged to reflect present-day practice. The more important changes comprise revised definitions of regulating transformers, step-voltage regulators, and of classes O, A, B, and C insulating materials.

The principal changes in Section 2, on Standards Common to Transformers, Regulators, and Reactors, are as follows:

The basis for expressing efficiencies has been modified to give the basis for expressing losses of transformer apparatus, which is in line with present practice.

Table 1, giving limits of observable temperature rise, has been clarified and brought up to date by changing the 75-degree observable temperature rise to 80-degrees rise for Class B insulation.

A 70-degree hot-spot rise limit has been incorporated for forced-air-cooled transformers when the forced-air-cooled rating is supplemental to the self-cooled rating.

Under "Insulation Classes and Test Designations," the method of impulse testing the neutral has been modified to permit the application of the impulse voltage to the line terminals, and allowing the impulse wave at the neutral to rise to the required kilovolt values.

[1] Research Engineer, General Electric Company.

Table 2, giving a general summary of low frequency and impulse tests for all classes of transformers, regulators, and reactors, has been completely modified to clarify the material and bring the impulse test values in line with the new basic insulation levels that have been adopted by the Industry. Also, the low frequency tests from 50 kilovolts and up have been rounded out to the nearest five numbers.

New Table Gives Minimum Insulation Class

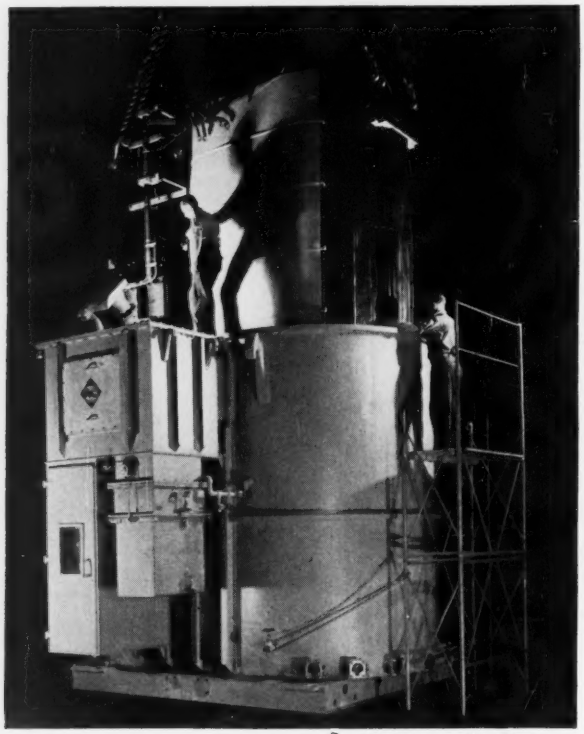
Table 3 is new and gives minimum insulation class at the transformer neutral when it is solidly grounded through a current transformer, through a regulating transformer, and through fault neutralizer or isolated but impulse protected. Values are set up for transformers with winding insulation classes ranging from 1.2 to 345 kv at line end.

Table 4 is new and gives standard withstand voltages for apparatus bushings, these values being based on AIEE Standards No. 21.

Section 2.051, covering requirement for dielectric strength of transformer oils when shipped, has been raised from 22 to 26 kv.

Section 3 on Standards for Distribution, Power, and Regulating Transformers and Reactors other than Current-Limiting Reactors, has been enlarged to include regulating transformers which were previously given in another section.

The information to be given on the name plate has undergone considerable modification to bring it in line with present-day practice.



Courtesy Allis-Chalmers

One of the larger industrial transformers.

Also, Table 8, giving standard accessories for 500 kva and less, has been brought up to date.

Section 4 on Standards for Instrument Transformers has been enlarged from five pages in the previous draft to approximately nine pages in the new Standards. The principal modifications are as follows:

The number of preferred primary current ratings for current transformers has been reduced from 29 to 21, and some reduction has also been made in primary current ratings for double-ratio current transformers.

The two previous lists of standard burdens for rating purposes have been consolidated into one list, and certain new ones, having to do primarily with metering, have been added. In addition, the designation of the burdens has been made self-identifying.

A decided improvement in the method of rating current transformers for metering accuracy has been effected. The new method classifies the current transformers in respect to accuracy in relation to the error produced in the wattmeter indication, instead of on a separate basis of ratio error and phase angle for the transformer itself as in the previous standards.

A method of classifying current transformers in respect to accuracy for relay service has been added.

The application of current transformers for relay service presents a broad problem and in order to facilitate applications for this purpose a preferred method of presenting essential data has been established.

An improvement has been made in the method of rating current transformers for their mechanical strength.

Considerable confusion resulted from the former method of presenting preferred ratios for potential transformers and the required insulation tests. This has been overcome by combining in one table the preferred ratios with the required dielectric tests for potential transformers.

Rating in Amperes Changed

Section 5, on Standards for Constant-Current Transformers of the moving-coil type, are essentially the same as in the previous draft with minor modifications.

Section 6, on Standards for Induction and Step-Voltage Regulators, has had the part referring to regulating transformers removed and incorporated in Section 3 as previously pointed out. Other than this, the changes are of a minor nature.

The principal change in Section 7, Standards for Current-Limiting Reactors, is in revising the rating in amperes to be more in line with present-day practice, and in conformity with those used for current transformers. Shunt reactors have been removed from Table 13 giving Standard Insulation Tests.

Section 8, Standards for General Purpose Specialty Transformers, is a new section, based principally upon NEMA Standards for this class of transformers.

While no major changes have been made in the Test Code, many minor modifications have been made to bring it up to date and to keep the material in agreement with various changes made throughout the Standards. A better topical arrangement of the material has been made. Also, a few errors that occurred in the previous draft have been corrected.

In Section 11, covering Guides for Operation of Transformers and Regulators, short-time overloads for both recurrent and emergency conditions have been increased for the longer times and have been extended from 2 hours as given in the previous draft to 24 hours. This change in the overload values does not give as high emergency short-time loads as those recently recommended by the AIEE and published in the September issue of *Electrical Engineering* under the title of "Interim Report on Guides for Overloading Transformers and Voltage Regulators." These new emergency overloads given in the Interim Report are for rare emergency cases that occur not more than approximately once a year and in which case a small amount of life, not more than 1 per cent, is taken out of the transformer. On the other hand, the emergency overloads given in these Guides can be used more frequently without taking any more life out of the transformer than is taken out under usual service conditious.

A complete index is given to facilitate locating the material in the Text.

Although unanimous agreement has been reached in the sectional committee on the publication of these Standards, there are, of course, items in which improvement can be made, and also a few items which represent compromises arrived at in order to expedite publication. Sectional Committee C57 will continue its work in ironing out the differences of opinion, and taking advantage of suggestions for changes and additions resulting from the use of these Standards. It is planned to publish an addendum report once a year, in order to keep the standards up to date.

American Safety Standards Recommended to Employers

The American Standard Safety Codes have been recommended to every employer as representing a minimum of acceptable practice for compliance with the Walsh-Healey Public Contracts Act. The recommendation was made by the Division of Public Contracts of the U. S. Department of Labor in the Division's new *Basic Safety and Health Requirements* which have been compiled for the guidance of employers subject to the Act. The Act provides that no work performed under contracts with the Government shall be carried out "in any plants, factories, buildings, or surroundings, or under working conditions which are insanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of the said contract".

Compliance with the safety laws and regulations of the State in which the work is being performed constitutes prima facie evidence of compliance with the Act. Such wide differences exist between the requirements of different states, however, that the Public Contracts Division has found it necessary to clarify and standardize its requirements. This has been done in the new publication, and the requirements included represent a consensus as to what constitute minimum standards of performance, the Division announces. They are intended as a guide rather than as requirements to be enforced, and it is not intended that they shall supplant existing State laws, codes, or standards dealing with safety and health conditions for workers.

Throughout the sections many references are made to American Safety Standards. Compliance with the American Standard Building Exits Code, for example, is acceptable under the section on Fire Prevention and Protection. Rooms in which there may be explosive concentrations of dust, gases, or vapors shall have explosion proof electrical fixtures and equipment exclusively in accordance with the National Electrical Code and National Electrical Safety Code, declares the section on Housekeeping, Material Storage, and Handling. Compliance with applicable safety standards approved by the American Standards Association is acceptable for guarding power transmission and other machinery. Protective equipment conforming to requirements of the Safety Code for Head and Eye Protection approved by the American Standards Association is acceptable. Color distinction for piping systems shall be substantially according to the requirements of the Scheme for Identification of Piping Systems, also approved by the American Standards Association.

In addition to the long list of American Safety Standards which are recommended to every employer as representing a minimum of acceptable practice, the standards and codes of the National Fire Protection Association are recommended.

Copies of the *Basic Safety and Health Requirements* are available from the Superintendent of Documents, Government Printing Office, Washington, D. C.

New Foreign Standards Now in ASA Library

THE following new and revised standards, just received by the American Standards Association, may be borrowed by ASA Members, or ordered through the ASA Library.

Australia

Identification of Pipes, Conduits, Ducts and Cables in Buildings, Structures and Premises (Draft Emergency Standard) No. (E) A503

Canada

Canadian Electrical Code, Part II:

Electric Air-Heaters, Construction and Test (2nd ed) CESA Specification C22.2—No. 46-1942 50¢

Inherent Overheating Protective Devices for Motors (1st ed) CESA Specification C22.2—No. 77-1942 50¢

Pole Line Hardware, Specification for (1st ed) C83-1942 Thirty new sections added

Round Timber Piles CESA Specification No. A56-1942 50¢

Great Britain

New British Standards

Grading Rules for Structural Timber BS 940—Part 2-1942

Code of Practice for the Provision of Engineering and Utility Services in Buildings BS1043-1942

Visual Indicator Lamps for Use on Telephone and Telegraph Switchboards BS1050-1942

Moisture in Relation to Texile Materials BS1051-1942

Engineers' Comparators for External Measurements BS 1054-1942

Amendments to British Standards

Colliery Tub Drawbars, Shackles and Couplings (Amendment to BS 291-1927) PD 7

Fire-resistance, Incombustibility and Non-inflammability of Building Materials and Structures, Definitions for (Amendment to BS 476-1932) PD 3

Exciter Lamps for 35 mm Projectors (Amendment to BS 1015-1942) PD 20

Manganese Steel Gas Cylinders for Atmospheric Gases (Amendment to BS 1045-1942) PD 4

Revised British War Emergency Standard

Doors (superseding BS 459-1941) BS 459-1942

New British War Emergency Standards

Aluminum Bronze Ingots and Castings BS 1031 to 1032-1942
High Tensile Aluminum Ingots and Castings BS 1072 to 1073-1942 } 1 vol

Schedule of Sizes and Types of Metal Collapsible Tubes BS 1049-1942

Mild Steel Wire for General Engineering Purposes BS 1052-1942

Water Paints and Distempers for Interior Use BS 1053-1942

Commercial Invoices BS 1055-1942

Painting of Buildings in War-Time BS 1056-1942

Substitute Paints for Exterior Finishing BS 1057-1942

Phosphor Bronze and Leaded Bronze Ingots and Castings (1 vol) BS 1058 to 1061-1942

Code of Practice for Planning of Electric Wiring Installations Low and Medium Voltage BS 1062-1942

New British War Emergency Standards (Continued)

Wiring on Cleats for Low-Voltage and Medium-Voltage Electric Lighting and Power Installations BS 1063-1942

Wiring in Conduit for Low-Voltage and Medium-Voltage Electric Lighting and Power Installations BS 1064-1942

Outdoor Distribution Systems for Low-Voltage and Medium-Voltage Electric Lighting and Power Installations BS 1065-1942

Bell and Alarm Systems Extra-Low Voltage or Battery-Operated BS 1066-1942

250-volt Metal-Sheathed Impregnated Paper-Insulated Plain Annealed Copper Conductors BS 1068-1942

Cotton Belting Ducks BS 1069-1942

AC Arc Welding Plant and Equipment for Heavy Constructional Work BS 1071-1942

Amendments to British War Emergency Standards

Bronze Wire and Cadmium-Copper Wire for Telegraph and Telephone Purposes (Amendment to BS 175-1938) CG (EL) 777

Cored Solder, Rosin Filled (Amendment to BS 441-1932) PD 21

Testing of the Zinc Coating on Galvanized Wires (Amendment to BS 443-1939) PD 17

Hard-Drawn Cadmium-Copper Solid and Stranded Circular Conductors for Overhead Power Transmission (Amendment to BS 672-1936) CG (EL) 778

Definitions of Miscellaneous Textile Merchandise (Amendment to BS 983-1941) PD 8

Memorandum on British War Emergency Standards

PD 1—for attachment to:

Bronze (Gun-Metal) Ingots and Castings BS 382 to 383-1940

Leaded Gun-Metal Castings and Ingots BS 897 to 898-1940, and BS 900 to 901-1940

Leaded Bronze Castings and Ingots BS 960 to 965-1941

Copper Alloy Ingots and Castings BS 1021 to 1028-1942

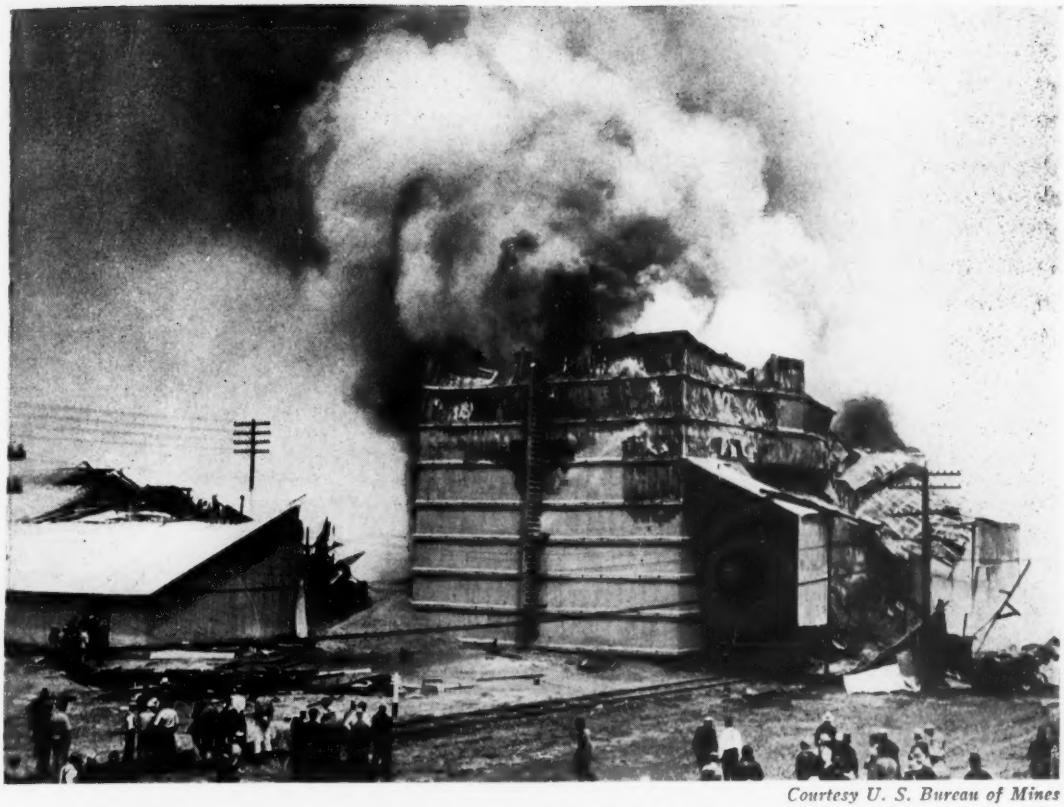
British War Emergency Draft

Wood Wool Building Slab, Specification for CG (B) 1488

The President Calls For Standardization

In his budget message to Congress, President Roosevelt said:

"Production and distribution of goods should be simplified and standardized; unnecessary costs and frills should be eliminated. Total war demands simplification of American life. By giving up what we do not need, all of us will be better able to get what we do need."



Courtesy U. S. Bureau of Mines

Small country elevators are frequently without adequate fire protection. The measures for dust-explosion prevention outlined in the new American Standard will help to prevent serious loss.

New Standards Show How To Prevent Dust Explosions

by Hylton R. Brown[1]

IN the 1943 edition of the American Standard Codes for the Prevention of Dust Explosions, a tabulation of the losses caused by dust explosions in industrial plants, in the United States alone, shows that more than 500 persons have been killed, over 1.200 have been injured, and the property loss has exceeded $55,000,000. To reduce these losses, a committee known as the Dust Explosion Hazards Committee has been giving attention for a number of years to the development of codes or standards governing manufacturing operations and maintenance in plants subject to the dust explosion hazard. This committee, composed of representatives of various industrial groups, insurance companies, and State labor and fire prevention organizations, has completed work on fourteen separate codes covering operations in different types of plants, and others are being prepared. (See list of completed standards in this series in the box on page 61.) The committee is not only organized as a sectional committee of the ASA under the joint sponsorship of the National Fire Protection Association and the U. S. Department of Agriculture but also as the NFPA Committee on Dust Explosions.

The committee has been encouraged in its efforts by the noticeable reduction in losses in industries where the standards for dust explosion prevention and protection have been adopted. The commit-

[1] Hylton R. Brown, Senior Engineer, Bureau of Mines, U. S. Department of Interior, is chairman of the National Fire Protection Association Committee on Dust Explosion Hazards, which also operates as a committee of the American Standards Association.

tee has proceeded on the basis that the operator or the man in the plant should be consulted in any plan to prepare recommendations covering his operations. Representatives of the industry affected have served as members of the subcommittee and in some instances a representative of the industry has been chairman of the subcommittee that presented the recommendations to the main committee for action. The enthusiastic cooperation of the industrial representatives in formulating safe operating and maintenance practices is reflected in the reduction of losses in their respective industries. At least two of these industrial groups in which heavy losses of life and property had previously occurred now have a record of more than 10 years' operation without loss of a single life.

Sulphur Dust Hazards Reduced

The Code for the Prevention of Sulphur Dust Explosions and Fires, one of the new standards recently prepared by the committee, is designed to guide efforts to reduce the fire and explosion hazard inherent in the processing and handling of sulphur in industry. The Bureau of Mines had leadership in the preparation of this standard because H. P. Greenwald of the Bureau's Central Experiment Station at Pittsburgh was designated as chairman of the subcommittee that prepared and presented the original text of this code to the main committee for action.

Although many ignitions and explosions of sulphur dust have occurred, the loss of life and property has fortunately been very low in comparison with losses in other industries.

This low record of loss is believed to be due to the fact that operators recognized the hazard early and developed a method of grinding sulphur in an inert atmosphere. Small grinding mills were supplied with flue gas from a coal or coke burner. This information was passed along through trade channels and generally adopted.

Laboratory tests show that sulphur dust can be classified as more explosive than many of the other dusts that have caused formidable losses of life and property. Sulphur ignites at a relatively low temperature—about 500 F—and a number of explosions are believed to have been started by metallic sparks. In experimental work, sulphur dust clouds have been ignited by sparks produced when a piece of steel was held against an emery wheel.

To provide protection against such ignitions, experiments have shown that it is necessary to reduce the oxygen content of the air in a sulphur grinding mill from the normal 21 percent to about 11 percent by introducing carbon dioxide. Some operators obtain their supply of inert gas from large natural gas or oil burners and have arranged for automatic control equipment that maintains the desired reduction in the oxygen content or shuts down the grinding mills if the supply of inert gas fails. Recommendations covering the installation and use of inert gas equipment are included in the standards for sulphur grinding

The wide representation which makes it possible for the Committee on Dust Explosions to iron out differences of opinion and find a solution for many difficult problems of operation is shown in the following list of committee members. The committee works under the administrative leadership of the National Fire Protection Association and the U. S. Department of Agriculture:

HYLTON R. BROWN, Bureau of Mines, U. S. Department of the Interior, *Chairman.*

The American Boiler and Affiliated Industries, *E. G. Bailey*
American Feed Manufacturers Association, *Eugene Arms*
American Society of Mechanical Engineers, *Ralph M. Ferry*
Associated Factory Mutual Fire Insurance Companies, *Heston S. Hirst*
Association of Mill and Elevator Mutual Insurance Companies, *Eugene Arms*
Corn Industries Research Foundation, *C. J. Alger*
Dust Collection Equipment Manufacture, *Lester C. Smith*
Edison Electric Institute, *E. R. Crofts*
Factory Insurance Association, *Winthrop M. Jones*
Fire Protection and Insurance Section, Association of American Railroads, *G. R. Hurd*
Grain Elevator Construction, *G. F. Butt*
International Association of Fire Chiefs, *Peter Steinkellner*
International Association of Fire Fighters, *John P. Redmond*
International Association of Governmental Labor Officials, *William L. Boylan*
International Association of Industrial Accident Boards and Commissions, *Joseph T. Faust*
Millers National Federation, *Eugene Arms*
National Board of Fire Underwriters, *H. W. Donnan; H. E. Newell*
National Electrical Manufacturers Association, *L. F. Adams*
National Safety Council, *R. L. Forney*
Northwest Country Elevator Association, *Capt. L. C. Webster*
Society of Grain Elevator Superintendents of North America, *Dean M. Clark*
Terminal Grain Elevator Merchants Association, *J. A. Mull*
Underwriters' Laboratories, Inc., *A. H. Nuckolls*
U. S. Department of Agriculture, Bureau of Agricultural Chemistry and Engineering, *David J. Price*
U. S. Department of Interior, Bureau of Mines, *H. P. Greenwald*
U. S. Department of Labor, *H. W. Brown*
Western Actuarial Bureau, *K. H. Parker*
Members-at-Large, *Robert Palm; George S. Rice; Edwin B. Ricketts*

and more detailed information on the subject is given in one of the other standards dealing with the use of inert gas for fire and explosion prevention.

Grain Elevators Protected

Another new code just completed by the committee is designed to reduce what has been the heaviest single group property loss—the destruction of grain elevators by dust explosion and fire. In this group, unusually high losses have resulted because of the concentrated values. Millions of bushels of valuable grain may be stored in bulk in a single structure where it is subject to loss by fire, damage by water used to extinguish the fire, or exposure to the elements if an explosion blows off the roof of the plant. Regulation of operating practices in such plants has been difficult because the owner or operator of the plant did not own or control the product he was handling. Many large grain elevators are used as storage units only, and the owner of the grain (who rented space in the house or arranged with the operator to store his product) insisted on receiving the same weight of grain that had been placed in the house originally. The collection or removal of dust was seldom attempted because the operator of the elevator would have to make good any loss in weight due to the removal of dust or foreign material. Application of suction frequently was prohibited. To avoid the possibility that unnecessarily strong suction would be applied by unscrupulous operators and some of the shipper's grain be removed with the dust, the weighmasters simply prohibited the application of suction at the point of receipt or before the grain was weighed. This practice resulted in a cumulative volume of dust traveling with the grain as it was transferred from point to point because dust is created every time the grain is turned or handled.

Removal of Grain Prevented

Through the cooperation of the Terminal Grain Weighmasters Association, represented on the Dust Explosion Hazards Committee by its president, J. A. Schmitz of Chicago, the difficulties encountered in attempting to provide for the collection of dust in grain-handling operations at terminal elevators have been overcome. The new standards for the Application of Suction and Venting for the Control of Dust in Grain Elevators and Storage Units provides for the collection of all dust under controlled conditions that will prevent abuses and at the same time provide a degree of protection that will greatly reduce the dust-explosion losses in the grain handling industry.

The committee also profited by advice from an engineer of one of the companies engaged in the installation of dust collectors and dust collecting equipment. Limitations have been placed on the velocity of the air at the face of suction hoods to prevent the removal of any grain with the dust

Three new safety standards for the prevention of dust explosions and dust ignitions have been approved by the American Standards Association since the first of the year. They are:

- Prevention of Sulphur Dust Explosions and Fires (Z12.12-1943)
- Prevention of Dust Ignitions in Country Grain Elevators (Z12.13-1943)
- Suggested Good Practices for the Application of Suction and Venting for the Control of Dust in Grain Elevators and Storage Units (Z12.14-1943)

A revised edition of the Safety Code for Use of Inert Gas for Fire and Explosion Prevention (Z12.10-1943) was also approved during the past month.

Other approved standards for prevention of dust explosions which have been in use for several years were reviewed by the committee during 1942. The committee's report showed that these standards continue to provide up-to-date and satisfactory requirements, and the ASA, therefore, reaffirmed them in December, 1942. This action was taken on recommendation of the National Fire Protection Association and the U. S. Department of Agriculture, sponsors for the project. The standards have been given a new date to indicate that they are up-to-date as of 1942. These reaffirmed standards are:

- Installation of Pulverized Fuel Systems (Z12.1-1942)
- Prevention of Dust Explosions in Starch Factories (Z12.2-1942)
- Prevention of Dust Explosions in Flour and Feed Mills (Z12.3-1942)
- Prevention of Dust Explosions in Terminal Grain Elevators (Z12.4-1942)
- Prevention of Dust Explosions in Woodworking Plants (Z12.5-1942)
- Prevention of Dust Explosions in Pulverizing Systems for Sugar and Cocoa (Z12.6-1942)
- Prevention of Dust Explosions in Coal Pneumatic Cleaning Plants (Z12.7-1942)
- Prevention of Dust Explosions in Wood-Flour Manufacturing Establishments (Z12.8-1942)
- Prevention of Dust Ignitions in Spice-Grinding Plants (Z12.9-1942)
- Prevention of Dust Explosions in the Manufacture of Aluminum Bronze Powder (Z12.11-1942)

The standards are available in one book from the ASA at $1.00 per copy.

collected, and inspection traps are to be provided to show that the suction has at no time been strong enough to pick up grain.

Fire and explosion protection at country grain elevators is another phase of the problem that has received the attention of the committee.

The exact extent of the dust explosion and fire loss in this group of plants, estimated to number 10,000, is unknown, but the best information available indicates that about 150 fires and explosions occur annually and cause a combined loss of about $3,000,000.

These isolated buildings, which provide an essential link in our grain-handling program, are generally without adequate fire protection or fire-fighting equipment. The structures are usually tall, and if a water system is provided the pressure may be too low to force sufficient water to the top of the house for fire protection purposes. The elevators often are beyond the limits of territory served by fire companies.

In such plants, protection against fire and explosion is largely a problem of eliminating sources of ignition because a fire once started probably will cause a total loss. With these facts in mind, the committee concentrated on the preparation of a set of recommendations that would emphasize the necessity of eliminating sources of ignition and dust accumulations that would permit flame propagation if an ignition occurred. Here again the committee obtained the cooperation of the country elevator associations; and the leader of one of their groups, Captain L. C. Webster of Minneapolis, served as chairman of the subcommittee that prepared the recommendations now incorporated in the Standards for the Prevention of Dust Ignitions in Country Elevators.

In addition to specific recommendations covering the particular hazards incident to the operation of equipment in industries for which they were prepared, the new codes follow the general arrangement of the standards previously approved and contain sections on building construction, location of machinery, selection of electrical apparatus, fire protection, venting, dust collecting and general maintenance.

All of the recommendations in the codes are based on data obtained in laboratory testing or past experiences of plant operators or explosion investigators who made available to the committee their first-hand knowledge of operating conditions and observations in the course of investigations following explosions. The codes are not generally retroactive in requiring compliance with the standards set up for construction or installation of equipment; but they are intended to serve as a guide for owners, operators, inspectors and safety engineers in making improvements, and it is assumed that the recommendations concerning maintenance and elimination of operating hazards will be closely followed. The excellent record of the industries that have reduced their losses by following the previously approved standards is an incentive for others to take cognizance of the hazards in their plants and adopt all possible precautions for the prevention of dust explosions.

Highway Traffic Standards Committee Sees Little Work for Duration

The coordinating committee in charge of highway traffic standards of the American Standards Association finds little prospect that it will be called upon for an effective standards program until after the war, it declared in its report to the Standards Council last month. As a result it plans to complete the one standard which it has under revision and then to remain in status quo for the duration unless it is presented with some specific problem to handle.

The report presented by the Highway Traffic Standards Committee to the Standards Council is reproduced in full below:

Annual Report

The Highway Traffic Standards Committee has taken no actions since the May, 1942, meeting of the Standards Council. This does not indicate a flagging interest on the part of the committee, but is due to the situation in this field which has been caused by the war.

At the present time a proposed final draft of a revision of the American Standard for Highway Grade Crossing Protection—D8-1937, is out to letter ballot of the sectional committee; and the anticipated submittal of this revision will require action by the Highway Traffic Standards Committee.

Because the war shortages have so severely curtailed highway transportation, most of the existing problems in this field are now centralized in various branches of the Federal Government. Therefore on the assumption that its inactivity will continue for an indefinite period, it has been proposed that after the Highway Traffic Standards Committee shall have completed its review of the forthcoming D8 revision, it remain in status quo with the present officers for the duration. In this way the committee's services will be available in case an occasional problem should arise for consideration. The committee would function in such cases, but not make any new studies or initiate any new work for the period of the war.

—Hawley S. Simpson, *Chairman*

Standardization Important In WPB "Rationalization" Plans

STANDARDIZATION and simplification became headline news during the past month when the War Production Board announced plans to speed up production of components for industrial equipment through "rationalization" of industry. At the same time it was announced that standardization and simplification may be expected to offer the most effective means of releasing critical materials for a possible increase in production of consumer goods.

The "rationalization" program, the War Production Board explained, is aimed at eliminating the many varieties of a single type of component part now being ordered and concentrating production on a single type which can be manufactured by mass production methods in a few plants. Standardization of types of builders' hardware and plumbing supplies, for example, is expected to release facilities for conversion to industrial equipment, such as boilers, guages, heat exchangers, etc. One of the important difficulties facing William M. Jeffers, the rubber director, lies in the fact that Mr. Jeffers needs valves, heat exchangers, and other equipment to complete his rubber program, whereas the military services need the same equipment for the production of aviation gasoline, escort ships, and chemicals to carry forward the war. At the present time, there are not sufficient production facilities to carry forward both programs at the same time.

Press reports indicate that this "rationalization" program is in the final stages of consideration in the War Production Board.

Also from the press come reports that cuts, in production of civilian goods are nearing rock bottom and that WPB is looking to simplification and standardization as one of the principal means of releasing materials and production facilities for an increase in civilian production.

Approximately 56 billion dollars worth of goods and services would be required annually to maintain this country's civilian economy on a minimum or bedrock basis, Joseph L. Weiner, Director of the Office of Civilian Supply, has advised James F. Byrnes, Director of the Office of Economic Stabilization. This, however, he explained, assumes an equitable distribution of the bedrock quantity of goods and services. The reduction in physical volume (which is some 32 per cent less than the value of the goods and services used for these same purposes in 1941) is not as great as it seems to indicate, however, since the bedrock requirements are based on a good deal of substitution and simplification, representing a lower unit cost than if these products were produced without standardization, he said.

The study, requested by Mr. Byrnes, is intended to serve as a basis for planning rationing, subsidies, the extent to which simplification and standardization can be used, and manpower.

"We do not expect the volume of civilian consumption as a whole to fall to bedrock levels this year," Mr. Weiner said in explaining the report, "although in a number of important consumer fields, such as metals and rubber, it is already at or near bedrock levels. In a number of other fields these levels will undoubtedly be reached by the end of 1943."

OPA Orders Grade Labels for Canned Fruits and Vegetables

Grade labeling of fruits and vegetables based on standards of the U. S. Department of Agriculture has now been put into effect by the Office of Price Administration. The first step in the labeling program, which is planned as an aid in tieing maximum prices to quality and also as an aid to the consumer in making use of ration coupons, has been applied to grapefruit juice. Every can must be labeled with the grade before it is delivered to a retail store, to institutional, industrial, or commercial users, or to an ultimate consumer.

OPA officials describe the new program as one of the most important steps that has so far been taken for the protection of the wartime consumer.

Almost the entire 1943 pack of fruits and vegetables will come under the grade-labeling provisions, the OPA has announced. Each fruit or vegetable will be added as its packing season comes up.

The grades established under the regulation are those already set up and defined by the United States Department of Agriculture. In the case of canned grapefruit juice, these are U. S. Grade A (or Fancy), U. S. Grade C (or Standard), and Off-grade (or Substandard). There is no B (or Choice or Extra Standard) rating for grapefruit juice.

If the packing process has been carried on under the continuous inspection of the U. S. Department of Agriculture, the grades may also be designated as "United States" or "U. S." grade; otherwise the designation "United States" or "U. S." may not be used.

Standards Issued by Associations and Government

(See "ASA Standards Activities", page 66, for new American Standards and progress on ASA projects)

For the information of ASA Members, the American Standards Association gives here a list of the standards received during the past month by the ASA Library for its classified files. With the increasing amount of material being received it has been decided to eliminate from the monthly list a few of those standards which may not be so important to ASA Members, such as Federal Specifications for foods. The list below therefore, includes only those standards which the American Standards Association believes will be of greatest interest to Members in connection with their war production.

The standards listed may be consulted by ASA Members at the ASA Library, or copies may be obtained from the organization issuing the standard. Addresses of these organizations are given for your convenience.

Associations and Technical Societies

American Iron and Steel Institute (350 Fifth Avenue, New York, N. Y.)

Steel Products Manual
Carbon Steel Sheets Sec 11 November 1942 25¢
Steel Tubular Products Sec 18 September 1942 25¢

American Petroleum Institute (Division of Production, 1205 Continental Building, Dallas, Texas)

Casing, Drill Pipe, and Tubing Supplement No. 1 to API Std. 5-A December 1942
Line Pipe Supplement No. 1 to API Std. 5-L December 1942

American Society for Testing Materials (260 South Broad Street, Philadelphia, Pa.)

ASTM Specifications, Methods of Test, etc.

The letter T following a designation indicates the standard is Tentative. Each standard is 25¢

Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes A179-42 (Also an Emergency Alternate Provision, EA-A179)
Carbon-Steel Forgings for General Industrial Use A235-42
Pyrometric Cone Equivalent of Refractory Materials C24-42
Panel Test for Resistance to Thermal and Structural Spalling of Refractory Brick C38-42
Testing Insulating Fire Brick C93-42
Panel Test for Resistance to Thermal and Structural Spalling of High Heat Duty Fireclay Brick C107-42
Panel Test for Resistance to Thermal and Structural Spalling of Super Duty Fireclay Brick C122-42
Asphalt Roofing Surfaced with Coarse Mineral Granules D249-42T
Testing Molded Materials Used for Electrical Insulation D48-42T
Testing Electrical Insulating Oils D117-42
Testing Solid Filling and Treating Compounds Used for Electrical Insulation D176-42T
Standard Methods of Testing and Tolerances for Tire Cord, Woven and On Cones D179-42
Continuous Filament Rayon Yarns D258-42
Woven Tapes D259-42T
Knock Characteristics of Motor Fuels D357-42T

ASTM Specifications—(Continued)

Surveying and Sampling Soils for Highway Subgrades D420-42T
Sampling and Chemical Analysis of Soaps and Soap Products D460-42
Spun Rayon Yarns and Threads D507-42
Sampling Paper and Paper Products D585-42
Ash Content of Paper and Paper Products D586-42
Casein in Paper (Qualitative) D587-42
Alpha-, Beta-, and Gamma-Cellulose in Paper D588-42
Knock Characteristics of Aviation Fuels D614-42T
Tensile Properties of Plastics D638-42T
Moisture in Paper, Paperboard, and Paperboard and Fibreboard Containers D644-42T
Basis Weight of Paper and Paper Products D646-42T
Molds for Test Specimens of Molding Materials Used for Electrical Insulation D647-42T
Evaluating Degree of Chalking of Exterior Paints of the Linseed-Oil Type D659-42T
Evaluating Degree of Checking of Exterior Paints of the Linseed-Oil Type D660-42T
Evaluating Degree of Cracking of Exterior Paints of the Linseed-Oil Type D661-42T
Sludge Formation in Mineral Transformer Oil D670-42T
Repeated Flexural Stress (Fatigue) of Plastics D671-42T
Conditioning Paper and Paper Products for Testing D685-42T
Qualitative Examination of Mineral Filler and Mineral Coating of Paper D686-42T
Quantitative Determination of Coating on Mineral-Coated Paper D687-42T
Pentosans in Paper D688-42T
Internal Tearing Resistance of Paper D689-42T
Compressive Strength of Plastics D695-42T
Coefficient of Linear Thermal Expansion of Plastics D696-42T
Water Vapor Permeability of Plastic Sheets D697-42T
Asphalt Siding Surfaced with Coarse Mineral Granules D699-42T
ASTM Thermometers E1-42

Association of American Railroads—Operations and Maintenance Department—Operating-Transportation Division, Telegraph and Telephone Section (30 Vesey Street, New York, N. Y.)

Circular No. T&T 333—23 Emergency Alternate Provisions

Associations and Technical Societies—(Continued)

National Aircraft Standards Committee (care of Aeronautical Chamber of Commerce of America, Washington, D. C.)

List of most recently approved Aircraft Standards

National Electrical Manufacturers Association (155 East 44th Street, New York, N. Y.)

High Voltage Insulator Standards Publication No. 42-83 November 1942 $1.00

Society of Automotive Engineers, Inc. (29 West 39th Street, New York, N. Y.)

New and Revised Aeronautical Material Specifications (43 new SAE specifications and 33 revisions are being published as of December 1, 1942. A complete set of these specifications in loose leaf form to supplement those previously issued, plus a new Index of all Aeronautical Material Specifications, may be obtained for $2.35.)

U. S. Government

(Wherever a price is indicated, that publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C. Otherwise copies of the document may be obtained from the governmental agency concerned.)

National Bureau of Standards (Washington, D. C.)

Butadiene and Styrene, Physical Properties of Letter Circular LC710

Devices for Air Raid Warnings Letter Circular LC706

Elevator Wire Rope Maintenance Circular C441 December 7, 1942 5¢

Standard Samples Issued or in Preparation by the National Bureau of Standards October 28, 1942 Supplement to Circular C398

Thermostat Setting and Economy in House Heating Letter Circular LC711 (supersedes LC694) December 30, 1942

Specifications, Tolerances, and Regulations for Commercial Weights and Measures and Weighing and Measuring Devices Handbook H29 (supersedes H22) September 26, 1942 60¢

Comercial Standards

List of Commercial Standards, Revised to January 1, 1943 Letter Circular LC713 (supersedes LC705)

Simplified Practice Recommendations

Approved by Industry

Dental Hypodermic Needles Revision of R108-34

School Furniture R191-43

In Print

Forged Axes R158-42 5¢

Forged Hatchets R160-42 5¢

Forged Light Hammers R159-42 5¢

Shovels, Spades, Scoops, and Telegraph Spoons R48-42 5¢

Surgical Gauze R86-42 5¢

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

The date after the title of the specification indicates when it becomes effective.

Aluminum-Alloy (Aluminum-Surfaced) (A1-17C2), (Aluminum-Copper-Magnesium-Manganese); plates, sheets, and strips (Amendment 1) QQ-A-361 March 1, 1943

Aluminum-Alloy (Aluminum-Surfaced) (A1-24C2), [Aluminum-Copper-Magnesium (1.5%)-Manganese]; plates, sheets, and strips (Amendment 1) QQ-A-362 March 1, 1943

Bearings; ball (Amendment 2) FF-B-171 February 1, 1943

Bits, Wood-Boring; and chisels, mortising, hollow (Amendment 1) GGG-B-383 February 1, 1943

Federal Specifications—(continued)

Crushed-Stone, Crushed Slag, and Gravel; for railroad ballast (new) SS-C-743 February 15, 1943

Felt; asphalt-saturated for flashings, roofing, and waterproofing (superseding HH-F-191) HH-F-191a March 1, 1943

Figures and Letters; stamping, steel (Amendment 1) GGG-F-311 February 1, 1943

Fuses:

cartridge, inclosed, nonrenewable (Amendment 1) W-F-791a March 1, 1943

cartridge, inclosed, renewable (fusible links not separately inclosed); and renewable-links therefor (Amendment 1) W-F-803a March 1, 1943

cartridge, inclosed, renewable (fusible links separately inclosed) (Amendment 2) W-F-805 March 1, 1943

plug, nonrenewable (Amendment 2) W-F-831 March 1, 1943

Heaters, Electric; water, storage, domestic (Amendment 1) W-H-196 February 1, 1943

Iron, Gray; casings (Amendment 3) QQ-I-652 February 1, 1943

Iron, Wrought (Refined); bars (Amendment 1) QQ-I-686a February 1, 1943

Irons; calking, wood (new) GGG-I-671 January 15, 1943

Jacks (superseding GGG-J-51) GGG-J-51a March 1, 1943

Leather; rigging (superseding KK-L-241) KK-L-241a February 1, 1943

Magnesium-Silicate; dry (paint-pigment) (new) TT-M-90 February 1, 1943

Oil, Castor; technical-grade (Amendment 1) JJJ-O-318 February 1, 1943

Oil; linseed, raw (Amendment 1) JJJ-O-336 February 1, 1943

Rosin (new) LLL-R-626 February 1, 1943

Sodium-Silicate; liquid (new) O-S-605 February 1, 1943

Tools; pipe-threading, hand (Amendment 2) GGG-T-581 March 1, 1943

Emergency Alternate Federal Specifications

Bars; reinforcement, for concrete E-QQ-B-71a December 9, 1942

Boxes; wood, nailed and lock-corner E-NN-B-621a December 21, 1942

Boxes; weed-crated fibre board (superseding E-NN-B-591, 11/3/42) E-NN-B-591 January 7, 1943

Fasteners; paper, flexible, metallic E-FF-F-111 December 21, 1942

Felt; asphalt-saturated, (for) flashings, roofing, and waterproofing (superseding E-HH-F-191, 1/8/42) E-HH-F-191a December 23, 1942

Felt; Hair E-C-F-201b December 17, 1942

Fencing; wire (barbed, netting and woven), black and galvanized (superseding E-RR-F-221, 5/12/42 E-RR-F-221 December 21, 1942

Flashlights; electric, hand (without batteries) superseding E-W-F-421a 2/4/42) E-W-F-421a January 7, 1943

Emergency Specifications—(continued)

Packing; flaxtow E-HH-P-106a December 4, 1942
Paper:
bond, white and colored (superseding E-UU-P-121c, 8/14/42) E-UU-P-121c January 1, 1943
general specifications (superseding E-UU-P-31a, 6/25/42) E-UU-P-31a December 17, 1942
index (superseding E-UU-P-258a, 7/19/42) E-UU-P-258a January 1, 1943
legal-cap, ruled (superseding E-UU-P-301, 6/25/42) E-UU-P-301 December 23, 1942
ledger (superseding E-UU-P-288, 6/25/42) E-UU-P-288 January 1, 1943
manifold (superseding E-UU-P-328a, 8/11/42) E-UU-P-328a December 23, 1942
printing, book, machine-finish (superseding E-UU-P-465, 6/25/42) E-UU-P-465 December 17, 1942
writing (superseding E-UU-P-641, 8/19/42) E-UU-P-641 December 23, 1942
Pipe; water, cast-iron (bell and spigot) E-WW-P-421 December 21, 1942
Remover; paint and varnish (organic-solvent-type) E-TT-R-251a December 21, 1942
Rope; wire (superseding E-RR-R-571, 9/2/42) E-RR-R-571 December 21, 1942
Sheeting; rubber (superseding E-ZZ-S-311a, 7/28/42) E-ZZ-S-311a December 4, 1942
Tableware; nickel alloy E-RR-T-46 December 9, 1942
Thinner; lacquer E-TT-T-266 December 21, 1942

Cancellations

The following Emergency Alternate Federal Specifications, having served their purpose, are hereby cancelled; the basic specifications will remain in effect:

Brass, Naval; bars, plates, rods, shapes, sheets and strips E-QQ-B-636
Bronze, Aluminum; bars, plates, rods, shapes, sheets, and strips E-QQ-B-666
Bronze, Aluminum; castings E-QQ-B-671a
Bronze, Phosphor; bars, plates, rods, shapes, sheets, and strips E-QQ-B-746
Copper; bars, plates, rods, shapes, sheets, and strips E-QQ-C-501a
Copper-Silicon-Alloy; bars, plates, rods, shapes, sheets and strips E-QQ-C-591a

Cancellations—(continued)

Copper-Silicon-Alloy; castings E-QQ-C-593
Nickel-Silver (German-Silver); bars, plates, rods, shapes, sheets, and strips E-QQ-N-321

Agricultural Marketing Administration (U. S. Department of Agriculture, Washington, D. C.)

Grades of Canned Grapefruit
Market Classes and Grades of Dressed Veal and Calf Carcasses Circular No. 103 Revised August 1942 15¢

U. S. Department of Labor—Children's Bureau (Washington, D. C.)

Advisory Standards for Employment Involving Exposure to Carbon Disulfide No. 4 December 1942

Federal Works Agency—Public Buildings Administration (Washington, D. C.)

Air Raid Protection Code for Federal Buildings and Their Contents August 1942 20¢

Division of High Transport—Public Roads Administration (Washington, D. C.)

Glossary of Bridge, Highway, and Soil Stabilization Terms (An English-Spanish and Spanish-English glossary)

U. S. Office of Civilian Defense (Washington, D. C.)

Protective Construction Revised August 1942

War Production Board (Washington, D. C.)

National Emergency Specifications for the Design of Reinforced Concrete Buildings Directive No. 9 Novem-10, 1942

ASA Standards Activities

Standards Available Since Our January Issue

Carbon-Steel Plates for Stationary Boilers and Other Pressure Vessels (ASTM A70-42) American Standard G29.1-1942 25¢
Cranes, Derricks, and Hoists, Safety Code American Standard B30.2-1943 $1.50
Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (ASTM B5-42) American Standard H17.2-1942 25¢
Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (ASTM B4-42) American Standard H17.1-1942 25¢
Marking Compressed Gas Cylinders to Identify Content American Standard Z48.1-1942 10¢
Photography
Photographic Paper Roll Leaders and Limit Signals American Recommended Practice Z38.1.4-1942 10¢
Tripod Connections for American Cameras American Standard Z38.4.1-1942 10¢
Tripod Connections for European Cameras with Adapter for American Tripods American Standard Z38.4.2-1942 10¢
Distance Scales Marked in Feet American Standard Z38.4.3-1942 10¢

Standards Available—(continued)

Focal Lengths of Lenses: Marking American Standard Z38.4.4-1942 10¢
Shutter Cable Release Tips and Sockets with Tapered Threads American Standard Z38.4.5-1942 10¢
Shutter Cable Release Tips and Sockets with Straight Threads American Standard Z38.4.6-1942 10¢
Rivets
Small Rivets American Standard B18a1-1942 (Addendum to B18a-1927) 10¢
Tinners', Coopers', and Belt Rivets American Standard B18g1-1942 (Addendum to B18g-1928) 10¢
Textile Testing Machines, Specifications for (ASTM D76-41) American Standard L15.1-1943 25¢
Transformers
Guides for Operation of Transformers American Standard C57.3-1942
Test Code for Transformers, Regulators and Reactors American Standard C57.2-1942
Transformers, Regulators and Reactors American Standard C57.1-1942
} $1.25
Welded and Seamless Steel Pipe (ASTM A53-42) American Standard B36.1-1942 25¢

Standards Approved Since Our January Issue

Engineering and Scientific Graphs for Publication American Standard Z15.3-1943

Markings for Grinding Wheels American Standard B5.17-1943

Standards Being Considered by ASA for Approval

Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)

Cold-Rolled Strip Steel (ASTM A109-38) G47

Colored Textiles, Fastness L14

Graphical Electrical Symbols for Architectural Plans Z32.9

Graphical Symbols for Power, Control and Measurement Z32.3

Standards Being Considered—(continued)

Keyways for Holes in Gears B6.4

Lime
- Limestone, Quicklime, and Hydrated Lime, Methods of Chemical Analysis of (ASTM C25-29)
- Quicklime for Structural Purposes, Specifications for (ASTM C5-26)

Rotating Electrical Machinery Revision of C50-1936

Threaded Cast-Iron Pipe for Drainage, Vent, and Waste Services

Standards Submitted for Consideration Since Our January Issue

Railroad Highway Grade Crossing Protection Revision of D8-1937

American War Standards

Standards Approved and Published

Accuracy of Engine Lathes B5.16-1941 25¢

Allowable Concentration of Cadmium Z37.5-1941 20¢

Code for Electricity Meters (Revision of Paragraph 827) C12WS-1942 10¢

Color, Specification and Description of Z44-1942 25¢

Domestic Gas Ranges, Approval Requirements Z21.1ES-1942 $1.00

Electrical Indicating Instruments (2½ and 3½ Inch, Round, Flush-Mounting, Panel-Type) C39.2-1943 50¢

Fixed Mica-Dielectric Capacitors C75.3-1942 50¢

Gas Water Heaters, Approval Requirements Z21.10WS-1942 $1.00

Machine Tool Electrical Standards C74-1942 40¢

Manganese, Allowable Concentration of Z37.6-1942 20¢

Men's Safety-Toe Work Shoes, Specifications for Z41.1-1943 20¢

Photographic Exposure Computer Z38.2-1942 $1.00

Protective Lighting for Industrial Properties A85-1942 50¢

Quality Control
- Guide for Quality Control Z1.1-1941
- Control Chart Method of Analyzing Data Z1.2-1941

(In one Volume 75¢)

- Control Chart Method of Controlling Quality During Production Z1.3-1942 75¢

Straight Screw Threads for High-Temperature Bolting B1.4-1942 25¢

Standard Approved Since Our January Issue

Pressure-Temperature Ratings for Steel Pipe Flanges, Flanged Fittings and Valves (Revision of Tables 6 to 11 inclusive, American Standard B16e-1939) B16e5-1943

Standards Under Way

Acme Screw Threads for Aircraft B1

Allowable Concentration of Xylene Z37

Allowable Concentration of Xylol Z37

Children's Sizes L11

Class 125 Cast-Iron Flanged Fittings B16a

Color Code for Lubricants for Machinery Z47

Goggles and Respiratory Equipment, Standardization and Simplification of

Standards Under Way—(continued)

Military Radio Equipment and Parts C75

1-2. Insulating Materials
- (a) Ceramics
- (b) Steatite
- (c) Porcelain
- (d) Glass
- (e) Glass-Bonded Mica
- (f) Treating, Filling, and Impregnating
- (g) Plastics
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